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MANPOWER RESEARCH AND MANAGEMENT IN
LARGE ORGANIZATIONS

Eli Ginzberg, et al

Office of the Director of Defense Research and
Engineering
Washington, D. C.

20 August 1971

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A TASK FORCE REPORT on the DEPARTMENT OF DEFENSE

MANPOWER RESEARCH & MANAGEMENT

IN

LARGE ORGANIZATIONS

June 1971



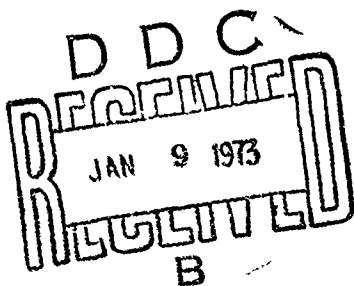
A Report of the . . .

Task Force on Manpower Research

Defense Science Board

Office of the Director of Defense Research and Engineering

Washington, D.C., 20301



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A Task Force Report on the Department of Defense

MANPOWER

Research and Management

In Large Organizations

June 1971

A Report Of The

Task Force on Manpower Research

Defense Science Board

Office of the Director of Defense Research and Engineering

Washington, D. C. 20301

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OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D. C.

21 August 1971

TO: THE SECRETARY OF DEFENSE

THROUGH: THE DIRECTOR OF DEFENSE RESEARCH
AND ENGINEERING

The Defense Science Board's Task Force on Manpower Research has completed its study of how manpower research could contribute to improved management of the Department of Defense as it confronts the problem of maintaining an adequate defense posture in the face of reduced personnel ceilings. The final report on the study is hereby submitted. The principal recommendations of the Task Force are summarized in the forwarding memorandum of its Chairman, Dr. Eli Ginzberg.


Gerald F. Tape
Chairman
Defense Science Board



OFFICE OF THE DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D. C. 20360

7 July 1971

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Final Report of Task Force on Manpower Research

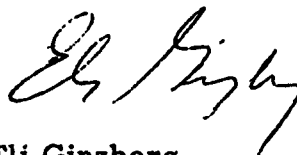
1. Pursuant to memorandum 10 February 1970 from the Director, Defense Research and Engineering for Chairman, Defense Science Board (Appendix I) the Manpower Research Task Force thereby convened is pleased to submit its final report: Manpower Research and Manpower Management: Task Force Report on the Department of Defense.
2. This report is responsive to the two principal specifications: "to determine high priority problems in the fields of manpower and personnel planning that the Armed Forces are likely to encounter; and to assess DoD research capabilities and policies."
3. The Task Force held nine meetings between May 1970 and April 1971 during which it heard forty-three experts from the Department of Defense and from the outside (Appendix II); it reviewed many documents submitted by the Armed Forces; and its own members prepared special analyses.
4. The principal recommendations of the Task Force follow:
 - a. an increase in funding for manpower research of the order of 25% for each of the next three years from the present base of about \$40,000,000 annually;
 - b. more emphasis on macro-studies with broad DoD policy implications;
 - c. strengthening of the leadership role of DoD in the management of manpower research;

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d. more interchange between DoD and the civilian research community, and more reliance on external sources for carrying out research assignments;

e. more education for junior and senior officers in manpower management so that they can be more responsive to the potentialities of manpower research.

5. The Task Force gratefully acknowledges the assistance received from the Director of Defense Research and Engineering and the Assistant Secretary of Defense (M&RA) and from their staffs as well as all other individuals who facilitated its work.



Eli Ginzberg
Chairman, Task Force on
Manpower Research

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FOREWORD

At the beginning of the 1970's the United States is characterized by the dominance of large organizations in business, government, labor, higher education, health. The prototype of the large organization is the Department of Defense, which has a budget of \$75 billion in Fiscal Year 1971, a work force of over four million and annual expenditures for manpower of over \$40 billion.

The Department of Defense has about four times the number of employees of the American Telephone and Telegraph Company, the largest civilian employer in the country. In addition, during the past thirty years, except for one short period, the military has relied on the Selective Service System to help it meet its manpower requirements.

The President and the Congress broadly agree that by July 1973 the Services will no longer rely on the draft to meet their manpower requirements. Moreover, there is a growing consensus that, in the absence of a pronounced deterioration in the international situation, there must be a further shift in national priorities whereby a smaller proportion of the federal budget will be directed to defense. In addition, the Services in the years immediately ahead will have to adjust their organizations so that they can meet their new strategic goals with smaller numbers. As a senior Defense official has said, the Services are being eroded by the excessively large proportion of men who must serve in support positions.

Every large organization tends to operate on principles and practices which have proved to be effective in the past. But efficient management seeks to identify the changes that loom ahead and to adjust to them while it still has options. To accomplish this, management must look to manpower research for new knowledge and understanding about how it can better utilize its human resources, the key to enhanced effectiveness.

This report presents the findings and recommendations of the Task Force on Manpower Research, established by the Defense Science Board in early 1970 to determine how manpower research could contribute to improved management of the Department of Defense as it confronts the threefold challenge of operating without the draft, with substantially reduced personnel ceilings, and with the need to meet new strategic goals. If the Department of Defense is, as we believe, the

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prototype of large organizations, our findings and recommendations will have relevance for large business, nonprofit, and civilian governmental organizations.

Part One: SUMMARY

Findings and Recommendations

1. With respect to the scale, scope and quality of manpower research in the Department of Defense, the Task Force finds that:

a. The DoD spends approximately \$1.00 on manpower research for each \$1,000 of payroll in contrast to \$1.00 for weapons-related research for every \$3.00 spent for hardware procurement. This fact, combined with the fact that more than half of the total DoD budget of about \$75 billion is spent on manpower, strongly suggests the need for increased emphasis on manpower research.

b. In Fiscal Year 1971, the Defense budget for research in the Behavioral Sciences totaled \$37 million, of which three-fifths was concentrated on manpower selection and training. The other two-fifths was divided between research in human performance and human factors engineering and research into foreign military security environments.

c. The bulk of the funding for manpower research in selection and training has been for basic research and for exploratory or advanced development. Relatively little additional money (\$1.2 million in Fiscal Year 1971) has been directed to the analysis of alternative uses of manpower resources. This has left both OSD and the Services poorly prepared to cope with such complex issues as the attractiveness of alternative packages of pay and other benefits and innovative choices among such packages which could make the greatest contribution toward increasing the flow of volunteers. While the Services have begun to explore the application of new models and related techniques for manpower planning, the total effort in this arena to date has been relatively modest although advances in systems analysis and computerization offer potentially important gains for manpower planning and management.

d. The Defense Department could benefit substantially from improved personnel data bases and research methodology for designing and assessing alternative policies and programs to deal with the large number of complex manpower and related issues it now confronts or will soon face: the elimination of the draft, force reduction and restructuring, racial tensions, drug abuse, enlisted men-officer relations, civilian attitudes toward the military and other structural and attitudinal changes in American society which impinge directly on the procurement, retention and utilization of military manpower. Its present research capabilities must be enhanced if it is to find constructive solutions for these difficult problems.

e. The Armed Services made important research contributions to manpower selection, classification, training and assignment during and shortly after World War II. Having established a high order of competence in these areas, their research staffs have continued to concentrate on these areas during the past 15 to 20 years so that these efforts are now yielding diminishing returns. This trend was reinforced by the following: the tendency of all researchers to keep working in fields in which they have acquired specialized knowledge and competence; the relative ease with which these problems could be broken up into manageable pieces which lend themselves to experimental design for which approval and funding could be more readily secured; the relative ease with which the research could be conducted and publication credit earned by the principal investigator and his associates.

f. Under proper conditions, additional investment in manpower research could yield substantial payoff in terms of responsive personnel policies and more effective manpower management systems. Proper conditions include the substantial strengthening of the present organizational structure, management, technical direction, staffing, contracting and consulting procedures, and improved goals and designs of the manpower research effort. These are the prerequisites for creating an environment for a broadened and deepened effort that would be likely to yield significant gains in manpower policy, programming, and utilization.

2. In light of these findings about the scale, scope and quality of the present manpower research program in the Department of Defense, the Task Force recommends that:

a. The manpower research budget for each of the next three years be increased by not less than half of the increase for Fiscal Year 1972 which amounted to 25%.

b. The additional sums might profitably be expended for the following ends: the broadening and deepening of data banks which would include information about the procurement, retention, and separation of enlisted men and officers, which would enable the Services to assess the probable impact on voluntary retention of altering one or more of the basic conditions of service; the building up of base line data about the changing attitudes, values, and behavior of uniformed personnel toward key military institutions and practices, especially those that impinge directly on the performance capability of the Services to meet their missions; and periodic studies to ascertain changes in these critically important determinants. Other areas include the exploration and adaptation of new manpower models and techniques (computer based)

in terms of total numbers and skill categories for both planning and operational purposes; a substantially increased effort in studies and analyses aimed at ascertaining the relative costs and effectiveness of various manpower-organization constellations, such as different mixes of military, civilian and indigenous personnel; more subsidized training for recruits prior to their reporting to active duty; the impact of alternative rotation policies; more reliance by the Services on contracting out research and on other contractual adjustments that might enable them to meet their missions with a smaller requirement for uniformed personnel. As we move toward voluntary service the Office of the Secretary of Defense and the Services must be in a position to assess anew the validity of the personnel policies and practices on which they have for so long relied.

3. With respect to the management and operation of manpower research the Task Force finds that:

a. There is no agency in the Office of the Secretary of Defense with clearly defined responsibility and adequate staffing to provide leadership for a broad manpower research program that is responsive to priority policy and programmatic goals of the Department of Defense.

b. The Army, Navy and Air Force are the principal agents in the Department of Defense responsible for manpower research. They design research programs to fit their needs, defend their budgets before Congress, and carry out the funded research. The Director of Defense Research and Engineering exercises review and approval of the Services' research proposals before they are incorporated into the Department of Defense budget and submitted to Congress for funding. Except for small funding directly to the Office of the Secretary of Defense agencies, circa \$2.8 million in Fiscal Year 1971 for manpower related research, the initiative in manpower research rests with the Services. Important long-range projects are not funded; many projects are not assessed with respect to their responsiveness to high priority goals; many of them are carried out on such a small scale that their value for policy guidance is vitiated.

c. The determination of requirements for manpower research, the approval and funding of research projects, and primary responsibility for their execution is carried out through the research and development channels, of both the Department of Defense and the Services which have formal or informal liaison and other elements, particularly the staff agencies directly concerned with manpower and personnel. This arrangement has been a source of strength by

concentrating limited manpower research capabilities in each of the Services within the same system as their much larger research and development efforts focused on materiel. But this arrangement has also demonstrated serious drawbacks stemming from the overriding preoccupation of each research and development organization with weapons systems development. Key military and civilian personnel in these organizations are physical scientists or engineers, and the physical science laboratory has provided the model on which much of the manpower research has been based.

d. Each Service designs and carries out its manpower research efforts in response to its specialized needs. Despite many aspects of unique Service environment, there is considerable overlapping among the Services in the heavily researched areas of selection, classification, assignment. While there is a small amount of coordination in manpower research programming among the Services, this is limited primarily to periodic exchanges of methods and results. It is rare for the Services to undertake a joint research program with joint staffing. This pattern of three--or to the extent that the Marine Corps pursues manpower research, four--largely independent programs often has suboptimal results. Moreover, problems of DoD-wide interest and concern frequently are not identified and researched because they fall outside the domain of any one Service.

e. Effective design of research projects and the utilization of research results has been inhibited by inadequate liaison between the policy makers who need the results of the research and those who perform it. Mutual lack of understanding has been exaggerated by the location of research agencies too far down the organizational structure to be readily available to the policy makers.

4. In light of these findings about the management and operations of manpower research, the Task Force recommends that:

a. The manpower research planning and management capability of the Office of the Secretary of Defense be strengthened by:

(1) Establishing a modest staff of specialists from the critical disciplines--economics, sociology, psychology, operations research--in the Advanced Research Projects Agency (ARPA) to enable it to play a larger role in the funding of manpower research, particularly projects of high priority, in close coordination with and responsive to the needs of the Assistant Secretary of Defense, Manpower and Reserve Affairs.

(2) Adding to the research staff of the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs to enable it to discharge the responsibilities for the substantially broadened planning, coordinating, contracting and monitoring functions recommended in this report.

(3) Assigning to this enlarged research staff, or developing next to it, a small group of manpower analysts with competence for manpower planning and policy studies to whom the Assistant Secretary of Defense for Manpower and Reserve Affairs could look for inputs to his decision-making.

(4) Providing a procedure whereby the staffs of the agencies mentioned above together with the Deputy for Human Resources, Research and Development, in the Office of the Director of Defense Research and Engineering (ODDR&E) and, where appropriate, manpower research specialists in other elements of the Office of the Secretary of Defense, such as Systems Analysis, serve as the planning group for all manpower research programs funded through specific appropriations to the Office of the Secretary of Defense.

b. The Director of Defense Research and Engineering and the Assistant Secretary of Defense, Manpower and Reserve Affairs issue a joint directive stipulating that the annual manpower research program originating in the Services be forwarded through established research and development channels only after it has been commented on by the Assistant Secretary for Manpower and Reserve Affairs in each of the Services after consultation with his senior military and civilian manpower advisers.

c. The Director of Defense Research and Engineering advise the Services that their Service-specific manpower research budgets will be held relatively constant over the next three years and that additional funds for important generic manpower studies will be requested for the Office of the Secretary of Defense (ARPA and ASD, M&RA). Additional resources will be made available to the Services by these OSD agencies in response to their submitting competitive proposals which are responsive to broad DoD manpower research objectives.

d. The top managers of the Office of the Secretary of Defense and the Services be directly involved in identifying the key policy issues in the manpower arena they are likely to confront and insure that the R&D and Manpower staffs develop research programs that are responsive to these key issues in both breadth and depth and

that these programs be funded at the appropriate level. Funding should be scaled to the size of the manpower problems under investigation; reprogramming the funding to help meet requirements for weapons systems developments should be precluded; a contingency fund should be established so that as emergencies arise new research initiatives can be undertaken.

5. With respect to the proper balance between in-house and external manpower research programs the Task Force finds that:

a. The Services have concentrated most of their manpower related research in their in-house laboratories. To a small degree they have relied on a few contractors with whom they have had long associations such as Human Resources Research Organization (HumRRO), Research Analysis Corporation (RAC), Center for Naval Analyses (CNA) and RAND. They have placed relatively few contracts with universities or other nonprofit or profit-making groups. This pattern has reduced the interaction of the Services' manpower research groups with the community of civilian research scientists and with other governmental agencies.

b. The research capabilities of the in-house laboratories have also been affected by the following: difficulties inherent in a management structure which conventionally invests administrative direction in military commanders and technical direction in civilian professionals; frequent lack of effective two-way communication between the research staff and those who use the research results; the aging of the civilian research staff concomitant with difficulties in recruiting new staff; unfavorable location of certain laboratories which interferes with their ability to attract and retain competent professional staff.

c. Additional weaknesses result from the tendency for many research requirements to originate in the laboratories and be sent to the top for authentication rather than being set by the policy and planning staff; the greater safety in funding research projects that are concerned with modest procedural and programmatic improvements than investigations focused on conflict-laden subjects such as racial tensions or drug use; the short assignments of senior manpower policy and planning staff which reduce their interest in and ability to establish major research requirements and to monitor them to completion and implementation; the lack of a broad spectrum of competences among research personnel which limits their ability to design and carry out complex interdisciplinary inquiries; institutionalized routines characteristic of large bureaucracies. In addition, the distinct preference of each Service to direct its own research restricts the scale and

scope of its research groups and laboratories thus reducing their potential for specialization.

d. Office of the Secretary of Defense agencies and the Services have moved slowly to develop relationships with outside research groups which could help them stay knowledgeable about potentially explosive situations. Every large organization needs knowledge in depth about critical attitudes and behaviors which it cannot readily obtain through conventional approaches because of the fear or hostility of those from whom such information must be obtained and the right of the individual to privacy. For instance, men in uniform are unlikely to volunteer information about their use of drugs; they will attempt to hide hostile feelings about other races; they are likely to mask their real reasons for choosing not to re-enlist. It requires considerable ingenuity and some risk, especially for a military organization, to explore such conflict-laden areas. But if they do not explore them, they will be vulnerable because they will be unable to take preventive or remedial action in crisis situations.

e. Many advantages could accrue to the manpower research efforts of the OSD and the Services if they were to seek the assistance of competent individuals and groups in the civilian professional community. Outsiders could make valuable contributions by enabling OSD and the Services to tap into a wider range of research skills; take advantage of recent breakthroughs in methodology; contract for the study of urgent issues; avoid building an unnecessary and elaborate bureaucracy.

f. There are also significant opportunities, which heretofore have been largely overlooked, for OSD and the Services to enter cooperative research undertakings with various federal agencies which have mutual interest in selective manpower research problems, specifically, the Departments of Labor, HEW, Commerce, Justice, the Veterans Administration and the National Science Foundation.

6. In light of these findings concerning in-house and external research efforts the Task Force recommends that:

a. The Services engage in more joint planning and execution including joint staffing of research projects with broad Service interest, so that each can more easily specialize its laboratories with corresponding gains in performance capabilities.

b. Greater specialization among the Services' human resources laboratories be in terms of subject matter rather than scope.

Large laboratories might profitably cover the entire range from basic research to applications.

c. Increased productivity of the laboratories also be sought through improved linkages between the policy staff and the research groups which would improve interaction between the two while providing the research personnel with the necessary stability and freedom to complete approved projects.

d. Since an important constraint on its increasing reliance on manpower research is the size of the national manpower research pool, the Department of Defense should:

(1) Make funds available either directly or through the dissertation grant program of the Department of Labor, through the National Science Foundation, the National Research Council, or some other appropriate agency for doctoral studies of graduate students working on manpower subjects that are defense-related.

(2) Explore with other large governmental, corporate and nonprofit organizations the desirability of inter-organizational funding of research efforts at one or more major universities or independent nonprofit research centers which, through historical, empirical, theoretical and comparative studies, would seek better understanding of the inter-relations between large organizational structures and manpower development and utilization. If the university or center staff were to work closely with personnel from the Department of Defense and the other sponsoring organizations, their findings and recommendations could be responsive to current and prospective military organizational and manpower challenges.

(3) Office of the Secretary of Defense and the Services should support defense-related research investigations designed by members of the civilian research community by facilitating scholars' access to appropriate statistical and related data which do not involve confidentiality of personnel and unit records and by underwriting part or all of the financing. The DoD might consider using the contract or grant mechanism for manpower research of the Department of Labor as a vehicle for this purpose or it might establish its own Project Office and grant mechanisms,

with a review panel which should include members of the civilian research community.

e. Since the improvement in the quality of the manpower research effort that the Defense Department will be able to achieve will depend in considerable measure on the extent to which it can draw upon, and interact with, the civilian research community, the following additional actions are recommended:

(1) The Defense Department should encourage its own researchers and those civilian investigators whose work it supports to publish their findings even when they reflect critically on one or another aspect of defense policy or programming. The presumption should be that, in the absence of clear and overriding evidence of danger to national security, publication should be considered the natural end result of all manpower research. Otherwise it will prove impossible for the Defense Department to attract and retain the active cooperation of qualified research personnel.

(2) OSD and the Services should keep under review the staffing of their scientific advisory boards to assure reasonable representation of the human resources disciplines. Moreover, they should explore additional ways of increasing the active participation of qualified members of the civilian research community. The gamut of such arrangements could include regular and ad hoc consultants to the human resources laboratories of the Services and involve civilian experts in the preparation or critique of a Technical Concept Paper for manpower research.

f. The Defense Department should increase its cooperative relations with other federal and private sector agencies by:

(1) Cooperating with other federal agencies such as the Departments of Commerce and Labor in investigations into areas of mutual concern in which these civilian agencies have specialized competence, such as, for instance, demographic projections of men of military age or follow-up studies of the occupational adjustments of veterans.

(2) Planning joint studies, such as to devise an early warning system about impending manpower changes incident to large-scale shifts in defense programming.

(3) Exploring, particularly with HEW and Labor, possible changes in and improved articulation among critical institutions and mechanisms involving guidance and counseling, technical training, adult education, licensing arrangements, labor market services which might reduce the loss of time and skill incident to men's entering or leaving the Armed Services.

7. The Task Force found that many weaknesses in manpower management and manpower research in the Department of Defense could be traced to the inadequate education and training of junior and senior officers. In the Task Force's view a strengthening of the Defense Department's manpower research efforts requires the following actions to remedy these shortcomings:

a. The introduction at each successive level of schooling in the Services of more attention to manpower and personnel problems which eventually should lead senior commanders to be more aware of the potential contribution of manpower research to improved manpower management.

b. The encouragement of students in the senior Service and inter-Service schools to undertake studies in manpower research and manpower management.

c. The expansion of opportunities at major universities or research centers for career officers to acquire advanced education and training in manpower research and related disciplines.

d. The modification of the assignment system so that more career officers, after they reach the grade of major or lieutenant colonel, can stay in the specialized field of manpower management and research.

e. The creation of opportunities for general officers, especially in senior staff positions, to learn about advances in manpower planning and programming and the potentialities of manpower research.

Part Two: ANALYSIS

1. Challenge and Response

On 10 February 1970, the Director of Defense Research and Engineering, Dr. John S. Foster, Jr., requested the Chairman, Defense Science Board to convene in the near future a Manpower Research Task Force. This request was the outgrowth of earlier discussions among the members of the Defense Science Board about the potentialities of strengthening the manpower research effort in the Department of Defense. Dr. Foster's memorandum and attachment are reproduced as Appendix 1 to this report. The desirability of initiating such an effort was rooted in the facts that, first, more than half of the total Defense budget is spent on the recruitment, training, pay and retirement of personnel; secondly, that the Armed Forces will soon be in a radically altered environment which will require them to introduce new manpower policies and programs if they are to discharge their functions effectively.

The goal set for the Manpower Research Task Force was to accomplish the following:

1. To delineate high priority problems in the fields of manpower and personnel planning which the Armed Forces are likely to encounter as they:

- a. Meet the President's goals for voluntary service;
- b. Implement reduced personnel ceilings;
- c. Adjust their manpower to new strategic missions.

2. To assess DoD research capabilities and policies with regard to:

- a. Its capacity to contribute needed knowledge to manpower planning and operations;
- b. The required scale of funding and personnel;
- c. Appropriate roles for OSD, the individual military departments, in-house laboratories and external research performers.

The Chairman of the Task Force drew up a list of potential members. The following accepted:

Dr. Douglas W. Bray, American Telephone & Telegraph Co.
Colonel Samuel H. Hays, U. S. Army (Retired)

Professor Garth L. Mangum, University of Utah
Dean William H. Meckling, University of Rochester
Professor Ithiel de Sola Pool, Massachusetts Institute of Technology
Mr. Edward Robie, Equitable Life Assurance Society of United States
Dr. Davis B. Bobrow, University of Minnesota

Dr. Bobrow, formerly a member of Dr. Foster's staff, and directly involved in organizing the Task Force, was appointed to the Task Force several months after its inception.

By virtue of their past assignments and experience, the members brought a wide range of perspectives to the work of the Task Force which greatly facilitated its analysis of the problems facing the Department of Defense and the directions where solutions must be sought.

The work of the Task Force was greatly facilitated by the excellent support it received from its staff officer, Lt. Colonel Austin Kibler, Deputy for Human Resources Research and Development of Dr. Foster's office; and from Lt. Colonel Forrest R. Ratliff and Dr. Ralph Canter, Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

Every group of outsiders, even when they are well informed, faces a major dilemma when called upon to review and make recommendations about a large organization, particularly one as large as the Defense Department. Unless the consultants take the time to understand the structure, policies, and operations of the organization germane to their assignment, their recommendations will lack credibility and solidity. But if they spend the time and energy required to become thoroughly informed, they may--and frequently do--run out of enthusiasm with the result that when their report is finally written, it recommends only a few minor changes and adjustments in the status quo.

Consultants face a second dilemma. Their presence creates varying degrees of anxiety among the personnel whose operations they are charged with assessing and who recognize that their operations may be disturbed, even undermined, by the recommendations the consultants will eventually make. Hence those being assessed tend to respond to the consultants' inquiries, questions, criticisms with an eye to protecting their responsibilities. The first and overriding rule of individual and organizational survival and growth is to protect one's missions, funds, and personnel and, if possible, to add to them.

It is easy for a stalemate to arise from the consultants' need and desire to learn the facts and the defensive ploys of those who are concerned about the interpretations and conclusions the outsiders may draw.

The Armed Services have developed a standard approach to meet this problem. Whenever they have to advocate or defend a position before "outsiders," they hold a formal briefing which is usually conducted by an officer of middle rank who is knowledgeable about the subject and who has recourse to simple or elaborate graphics to underscore the points he seeks to emphasize, in addition to his formal remarks that are usually available in written form. The proportion of time spent on formal presentations to critical questions and discussion is usually of the order of two or three to one. The interrogators are at a disadvantage since they often have had little or no opportunity to become informed of the facts prior to the briefing.

The Task Force on Manpower Research decided at the outset that it would consult broadly but, as an economy and efficiency measure, would not submit to formal briefings. Instead, it decided to prepare a list of questions to be submitted in advance to selected knowledgeable persons who would be invited to meet with the Task Force and discuss them. The invitees were informed of the approximate amount of time that would be available for their part of the agenda. They were encouraged to submit written materials prior or subsequent to their appearance before the Task Force.

Usually, representatives from OSD and the Armed Forces with a common interest participated jointly in a loosely structured discussion with the Task Force. On occasion, the Task Force heard one expert at a time if it had concluded that he would thus be less constrained in discussing contentious issues about which he might be in disagreement with his superiors. The Task Force learned informally, early in its work, of complaints about its interdiction of all briefings but these receded as the interested parties found that they had repeated opportunities to make known their points of view not only through oral presentations but by the submission of memoranda.

As Appendix 2 indicates, the Task Force heard the points of view of a wide array of informed persons from the Office of the Secretary of Defense and the individual Services; senior military and civilian personnel; individuals in policy and operating positions as well as laboratory directors and research personnel; persons in the research and development channel and those with policy and planning responsibility for manpower and personnel; consultants from outside the military

establishment. Thus, the Task Force made an effort to listen to every group with a significant interest in manpower research.

The Task Force was in touch with the Scientific Advisory Committees of the Services, but the inputs from this source were limited. Only the Air Force has an active Panel concerned with cognate matters. While the Army and the Navy have mechanisms for eliciting the advice of outside technical consultants, their respective Scientific Advisory Committees have not been directly, and surely not continuously, concerned with manpower research.

The Task Force met monthly from May through November 1970 and again in February and April, 1971, for a total of nine full-day sessions. But in more sense than one it was in continuous session throughout the entire year by producing, evaluating and exchanging reports, memoranda and comments among themselves, the staff, and senior personnel in the Department of Defense.

2. New Parameters

In the Attachment to Dr. Foster's memorandum which requested the Defense Science Board to establish a Manpower Research Task Force (Appendix 1), attention is called to the fact that the Department of Defense is "faced with a number of contingencies which may have critical impact on the military personnel management system." In this chapter we will note and briefly evaluate the more important forces that are responsible for altering the environment, internal and external, within which the Armed Forces have been operating for some time. The Attachment itself elaborates on three of them: volunteer force, manpower ceiling reduction, and changes in strategic guidance.

With respect to the volunteer force, the Attachment notes that the military services have been directed by the President to develop and implement plans for an all volunteer force. It states that a volunteer force could entail significant shifts in skill composition, racial mix, and educational level. It further notes that it will probably be necessary to provide "new non-economic incentives to create a working climate more in line with that of civilian institutions" in order to attract the top talent that the Services require. The Attachment further states that "Major changes in personnel policies including provision for lateral entry may be necessary." These are suggestive specifications of the type of changes that the Armed Forces may have to anticipate and respond to as they move from direct or indirect reliance on the draft to an all volunteer force. It should be noted parenthetically that while the personnel requirements of the Navy and the Air Force and, except for one brief period, the Marines, have been met in recent years exclusively by volunteers, the fact that the Army has been resorting to the draft has directed many men to the Navy or the Air Force. It is generally agreed that once the draft is suspended or eliminated, the Navy and the Air Force, together with the Army, will find it much more difficult to recruit the numbers to meet even much reduced force levels.

The Attachment contains the following amplification of "manpower ceiling reduction." It points to the fact that the "drastic reduction in manpower ceilings which are presently pending will require the comprehensive examination of means for increasing the productivity of individuals in the force." It further suggests approaches that might contribute to enhanced productivity: less labor intensive technologies; improved individual motivation; additional man-machine tradeoffs; improved teamwork. Additionally, such problems are noted as the best ways to implement force reduction without impairing operational

efficiency; organizational changes aimed at conserving manpower; preferred ways of trimming the least productive members from the force; the impact of manpower cutbacks on the larger society.

With regard to "changes in strategic guidance," the Attachment calls attention to the fact that when these guidelines are received, they will require shifts in the size and composition of the manpower force in terms of nature and levels of skills required, appropriate grade structures, and flexibility in the cross-utilization of manpower between mission areas. It concludes by stating, "Possible changes in recruitment, retention, training, education, and rotation policies must be evaluated."

The Attachment underscores the conviction of the senior staff of the Services and the Office of the Secretary of Defense that major changes are impending on the manpower scene that will greatly increase the difficulties already confronting the Armed Forces in attracting and retaining a balanced force within their established manpower and fiscal ceilings which will enable them to discharge their multiple missions effectively. A primary charge to the Task Force was to assess the "DoD research capabilities and policies" with regard to contributing needed knowledge to help solve these manpower problems and to make recommendations with regard to funding, personnel and organization of the manpower research effort better to meet these demanding responsibilities.

While the three problem areas identified in the Attachment are unquestionably of overriding significance they do not include all the high priority issues to which the Armed Forces will have to direct increasing attention in the years ahead if they are to attract and retain the quantity and quality of manpower they require for the effective discharge of their missions. We note below some of the additional problem areas which surfaced during the on-going discussions of the Task Force with senior military and civilian staff.

Since in many respects the military is the mirror image of civilian society we were not surprised to find that the Services acknowledge that they confront a wide range of racial problems on and off military bases about which they lack information in depth and the solutions to which are not at hand. One senior officer reported that when he suspected pervasive racial tensions and began to probe the problem, he was overwhelmed by its potential explosiveness to which most company and higher commanders were oblivious or which they were ignoring in the hope that the tensions and dangers would disappear.

The OSD and the Services have lately stepped up their research into racial attitudes and behavior and have taken steps to provide for more awareness and sensitivity on the part of those in positions of authority through formal courses and other forms of education and training. The on-going effective monitoring of and response to race relations remain a key challenge to the Services in the years ahead. Clearly the problem will not disappear through neglect and no military force can function effectively if it is riven by deep hostilities and lack of trust between the racial groups which comprise it.

Another arena of mounting concern to the senior staff is the widespread use of drugs, both non-addictive and addictive, in the continental United States as well as in overseas areas. Here is another problem that the Services have been slow to approach through focused research efforts, since they do not know where the leverage is on such a complex issue.

The Services, prodded partly by Congressional concern, have now begun to pay close attention to the drug problem. As in civilian life, so in the military, the scale, intensity and consequences of the drug problem are only dimly perceived. Firm knowledge is difficult to obtain and policies and programs continue to be shaped and reshaped by the limited information that is available and whose validity remains in question.

While the Office of the Secretary of Defense and the Services are directing increasing attention to the drug problem in seeking to delineate more sharply its parameters as well as to cope more effectively with its debilitating consequences for the individual and the operational unit, the intractable difficulties should not be minimized. The simple fact is that most persons are loath to confide even to medical officers that they use drugs because of the possible negative consequences.

A third challenge to which the Task Force's attention was repeatedly directed by many who appeared before it is the difficulty facing the Services in learning more about the radical changes that appear to characterize the youth of America. Several discussants stressed that the established ways in which the military has long treated both enlisted men and officers must be changed, radically and quickly. While the Air Force conducts a quarterly survey of Servicemen's attitudes and the Army has recently initiated a major effort under the title, "The American Soldier of the Seventies," the Task Force saw no evidence that any Service has yet developed an effective research design that would yield the systematic information they need to monitor

and assess the major changes that are occurring, nor have mechanisms for translating the findings into new policies and programs been developed. While the press has called attention to some of the initiatives undertaken by operational commanders to respond to the challenge of the youth revolution, we were impressed by the lag in the Services' research capabilities focused on this and related changes.

While we were unable to devote much time or attention to the research dimensions of what is known in the military as the man-machine interface, we received the impression that the Services are responding too slowly and are investing too few resources in this area. In light of the scale of the research and development expenditures for new weapons systems, the counterpart research concerns aimed at exploring the manpower implications are extremely modest. Yet the long-term costs and effectiveness of a new weapons system depend in large measure on the demands that will be made on men to operate and maintain them.

In this connection note should be taken of the proposed Institute of the Individual Soldier under the auspices of the Department of the Army, whose primary mission will be to "improve the lot of the individual soldier" through a systems engineering approach which will integrate the efforts of developer, logistician, trainer and user. Primary emphasis will be put on improving the physical environment, from helmets and body armor to food services to booby trap detection, but will also involve major efforts at strengthening the social and economic environment, which includes incentives and rewards, career management, dissent, equal opportunities, leadership. The request for FY 1972 funding is of the order of \$25 million, about half of which represents new money.

The early transition to an all volunteer force will create a series of new problems for which manpower research is the only way of taking their measure and of assessing the potential costs and benefits of alternative plans to meet them.

Next is the question of the reserves and the members of the National Guard. While both are deeply mired in politics, particularly Congressional politics, the OSD and the Services will be forced to pay closer attention to the reserves and to improve their readiness since, under a volunteer force, they become the primary basis for augmentation. Once the pressure of the draft is lifted, the reserves will face new and possibly acute problems in attracting and retaining the men they need. This much is certain: manpower research is needed to

explore the probable changes that loom ahead and the alternative solutions that might be developed.

The Task Force was startled to find that almost no one who appeared before it ever saw manpower as a problem of the Services as a whole--that is, as a mixed group comprising military, civilian, reserve and indigenous forces. Almost without exception the manpower problems facing OSD and the Services were seen and responded to as problems involving career military personnel on active duty. This presumption was characteristic not only of the senior military but also of senior civilian staff.

While senior staff personnel are understandably preoccupied with military procurement at a time when the Services are moving toward a volunteer force, the fact remains that research has a significant contribution to make in assessing the alternative sources of manpower that might be procured and retained--including contracting out--and in assessing the relative costs and benefits of different combinations for maintaining the Services at a high level of operational efficiency.

Related research efforts would explore and evaluate the relative advantages and disadvantages of the Services' underwriting the costs of various types of training prior to calling a man to active duty so that most of his tour could be spent in operational rather than training assignments. While the Services usually follow this pattern with respect to officer personnel, they have not adequately explored its potentialities for enlisted specialists.

The increasing sophistication of computer science has opened up new potentialities for OSD and the Services to broaden and deepen their efforts in manpower research and to utilize the results to strengthen their manpower management systems. The Task Force was impressed that each of the Services has made some progress to exploit these new developments but it appears that they have moved ahead more successfully to use computer-based systems for personnel management and have made less use of them to date for forecasting, planning, and simulation for planning of policy.

While it would be a mistake to underestimate the problems that lie in the path of developing useful dynamic models for manpower analysis and management, the fact that progress will be made slowly is no reason not to pursue this approach aggressively. Because of its size, control over personnel and extensive record-keeping, the military environment is ideal for exploring the potentialities of advanced computer-

based models for manpower research and management. Much more can be done in this direction than the Services have yet ventured.

As in the civilian sector, part of the difficulties lies in the slow development of software. For instance, there is some recognition of the desirability of major restructuring of present jobs to facilitate greater flexibility in personnel assignments as well as to create conditions where men will face more challenging work and thus gain more satisfaction from it. But occupational analysis is still primitive and this fact hobbles early and easy progress in this important arena.

During the past several years the Department of Defense, frequently under Presidential prompting, has become increasingly concerned about improving the linkages between it and the civilian society to reduce the wastage that might otherwise ensue from arbitrary establishment of selection criteria, faulty assignment and training, and the failure to assist in the transition of military personnel to civilian life. Two outstanding efforts have been Project 100,000 and Project Transition. The first was aimed at adjusting military personnel policies and procedures so that men who otherwise would have been rejected for service because of low aptitude for learning were accepted and given an opportunity to serve; the second provided pre-separation counseling and often training and placement to ease the transition of men with limited skills back into the civilian economy. A related, much smaller program has focused on identifying servicemen with medical training and helping them to find civilian positions commensurate with their training and experience.

Manpower research has been used most directly to monitor Project 100,000 and to assess the extent to which servicemen with relatively low aptitude have succeeded in the military. But much additional research could profitably be invested in exploiting more systematically the longitudinal manpower records kept by the Services and linking them with existing or potential personnel records of these same men when they return to the civilian sector. Here is a unique resource that has scarcely been tapped.

The largest repository of longitudinal personnel records is kept by the Air Force at Lackland, but it has been difficult to keep the files up to date and even more difficult to obtain the research funds to explore how these longitudinal files could be more fully exploited toward the end of better personnel management. The Task Force feels that the OSD and the Services should attempt to increase their efforts to design a research methodology that could make use of the computer capability of retrieving at a relatively small cost the earlier records of large groups

of men which might yield important knowledge for new or improved personnel policies and programs.

The Department of Defense is the single largest training establishment in the United States with an estimated budget for instruction of over \$6 billion per year. It therefore should have a major interest in using manpower research to help improve its training capabilities and reduce the costs of preparing men to perform effectively. While each of the Services has traditionally devoted a considerable proportion of its total manpower research budget to seeking improvements in its training mission, there have been striking time lags in their response to new opportunities. For instance, the Air Force is behind the civilian airlines in its use of simulators for pilot training. Moreover, the Task Force feels that, in light of the size of their total training budgets, the Services have done less than would have been desirable in exploring the potentialities of computer-assisted instruction, on-the-job training, and other departures from classroom instruction. While the Task Force is cautious about the more extensive claims that are made on behalf of the new learning technologies and systems, it does believe that the field of instruction is sufficiently dynamic and the investment of the Services sufficiently large to warrant more research effort on the part of the DoD in this arena.

There are, of course, other areas where additional manpower research by the OSD and the Services would probably yield worthwhile results translatable immediately, or after a time, into large-scale economies and increased operational capabilities. However, the thrust of this chapter is clear. The Department of Defense confronts a number of critical manpower issues for which it has no effective answers. Moreover, the Department of Defense is in a position to make greater use of advances in theory and technology which, if properly exploited, could enable manpower research to yield important leads to improved manpower management.

In recapitulation: The Office of the Secretary of Defense and the Services should make increased use of manpower research to help them find answers to the following priority issues:

- The manpower and personnel adjustments that they must initiate to meet their requirements under conditions of volunteer force.
- The costs and consequences to the Services and to the country at large of alternative ways of meeting lower personnel ceilings in the future.

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- The changes which the Services must introduce into different aspects of their personnel system to insure that their manpower will be able to meet their new strategic and tactical missions.**
 - The ways in which every level of command could facilitate the reduction of racial tensions and contribute to racial harmony and equality of treatment for all minority group members.**
 - A close monitoring of the drug problem and an evaluation of alternative methods for containing and reducing it.**
 - The continuing evaluation by the Services of the important changes in the basic attitudes and behavior of young men so that personnel policies can be adjusted to accommodate both personal needs and operational effectiveness.**
 - Improvement of the ability of the Services to take account of a wider range of human resource factors in the design, production, and use of new weapons systems as well as other dimensions of the physical and social environment of servicemen.**
 - Exploring the changes that will occur in the recruitment of reservists when the draft is ended and taking steps to improve the readiness of reserve units.**
 - Consideration by the personnel managers of OSD and the Services of the gains and losses that would accrue from a different balance among military and civilian males and females and foreign nationals.**
 - Investigating the gains that might accrue from shifting much of the training that is now accomplished after a man comes on active duty to pre-service instruction, with DoD assuming some or all of the costs.**
 - Exploring the potentialities of manpower computer modeling for forecasting requirements and related personnel objectives.**
 - Basic and exploratory research directed at improving occupational analysis to facilitate greater flexibility in**

assignments and greater work satisfaction for the serviceman.

- More efforts at longitudinal research both within the military and between the civilian sector and the military to improve manpower policy and programming for the Services and to enable the individual to advance his career development.**
- More research focused on the relative strengths and weaknesses of alternative training methods for different groups of military personnel in various training environments.**
- Additional research directed to such critically important questions as officer evaluation and promotion and the role of leadership in group performance.**

3. Overview of Research

One of the first objectives of the Task Force was to become informed about the scale, scope and quality of the manpower research effort in which the Defense Department is engaged. A second, closely related aim was to reach at least a preliminary assessment of the strengths and weaknesses of the research effort and the directions along which progress might be made.

The Task Force found that the Department of Defense is spending in the range of \$40 million annually on manpower related research. In light of civilian efforts, the sum spent on military manpower research is considerable. For instance, Congress appropriates about \$3.5 million annually for the manpower research program of the U. S. Department of Labor under the Manpower Development and Training Act and the manpower and personnel research expenditures of a major American corporation are seldom in excess of \$1 million annually.

We did not assume, therefore, during the early months of our inquiry that the shortcomings and short-falls that we might encounter in our review were necessarily to be ascribed to lack of adequate funding, although many who talked with us, both from staff agencies and the laboratories, sought to persuade us that lack of funds was the critical factor.

On the other hand, of a total DoD budget of \$77 billion in Fiscal Year 1970, no less than \$39.8 billion represented manpower costs. This meant that more than half of the total budget--52%--represented the direct pay and allowances of military and civilian employees of the Department (\$24.3 billion); \$11.5 billion was devoted to support activities, of which training accounted for \$6.2 billion and transfers of personnel and belongings \$3 billion; another \$4 billion were required to cover the pay and allowances of the Guard and the Reserves and Retirement Pay.

In Fiscal Year 1971 total manpower costs declined from \$39.8 to \$39.6 billion but, because of a reduction in the total budget of \$4.1 billion to \$72.9 billion, the manpower component increased from 52 to 54 percent of the total.

In Fiscal Year 1971 combined expenditures for Human Resources Research and Development funded through the research appropriations of the Department of Defense totaled \$37 million. In short,

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for every dollar of operating manpower costs, the OSD and the Services spent 1/10 of a cent on research. The corresponding figures are \$1.00 for hardware research for every \$3.00 spent for hardware procurement.

In Fiscal Year 1971 the figures for manpower research were \$37 million out of a total budget of \$7.2 billion for all research and development. This means that for every dollar of weapons research, the Department spent slightly more than 1/2 of a cent on manpower research.

These data help to explain why so many of those who met with the Task Force strongly believed that the manpower research effort was being undernourished. The Task Force did not remain unsympathetic to these statements but it was unwilling to conclude without more probing and evaluation that lack of adequate funding was a major impediment to a strong manpower research effort.

Of the \$37.0 million of Human Resources Research and Development in Fiscal Year 1971, by far the largest amount was spent on Manpower Selection and Training--\$23.5 million, or just over 60%. Between \$4.3 and \$4.8 million was spent on each of the following three categories: Human Performance, Human Factors Engineering and Foreign Military Environment.

In any category scheme involving research, especially in a relatively new field such as human resources and manpower, questions arise about whether certain expenditures should be included or excluded. Among the foregoing categories, the most questionable are Foreign Military Environment and, to a lesser degree, Human Performance in which many of the projects are only tangentially related to manpower issues.

But if these are excluded, it does not follow that the total funds for manpower research were that much less. While we did not explore the matter in depth, we learned during the course of our inquiry that it is often difficult to draw a sharp line between research and development funds and operations and maintenance funds, some of which are used for manpower studies. To complicate matters further we were told that the Services occasionally reallocate R&D monies initially earmarked for manpower research to high priority weapons research efforts. In one Service, for example, the senior manpower staff informed us that they never knew exactly how much money they had available for manpower research until it had been spent. At any earlier point, some part of their allocation might be taken away from them.

In light of these limitations of the schema which DoD uses, we do not believe that there is much distortion of reality if we say that \$37 million approximates the scale of the effort.

A few comments about the relative efforts of the three Services in terms of their total expenditures and the distribution of their funds among different program categories. In Fiscal Year 1971 the respective budgets for manpower research were Army, \$9.4 million; Navy, \$9.8 million and Air Force, \$10.9 million--much the same order of effort. However, there were striking differences in the ways in which each Service spent its funds. Almost the entire Air Force effort was concentrated on Manpower Selection and Training and the Navy allocated about three-quarters of its funds to this effort. But the Army allocated only about half of its available research funds to Manpower Selection and Training.

Of the total of \$37.0 million appropriated for research and development, agencies in the Office of the Secretary of Defense (i. e., ARPA and M&RA) accounted for expenditures of \$6.9 million, somewhat less than the amounts spent by each of the individual Services. However, the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs, which has the principal substantive interest in the area, had a budget allocation of only \$600,000. The Advanced Research Projects Agency--an operating arm of the Director of Defense Research and Engineering--had \$5.8 million at its disposal but most of these funds were spent on projects that were more closely related to technology and national security forecasting methodology than to manpower.

It may be apposite to note at this point that there is literally no activity undertaken by the Department of Defense, or for that matter any other large or small organization, that does not have some relation to people and which therefore could be subsumed under a liberal definition of manpower. Organizations have no lives of their own and cannot act or react except through the people who comprise their staffs. We devoted a little time to exploring the boundaries of manpower research but we early decided that any definition would perforce be arbitrary. Hence, we decided to distinguish between manpower research per se and other research with a manpower component. We defined manpower research per se as "the search for new knowledge or new applications of existing knowledge aimed at the improved development and utilization of people."

It should be made explicit that the primary initiative with respect to manpower research rests with the Services which design their own programs, defend their budgets before Congress, and control the expenditure of their research funds. The Director of Defense Research

and Engineering exercises budgetary review within the Defense Department structure and has the authority--although it is used sparingly--to withhold funds that the Congress has appropriated in response to Service requirements.

Several consequences derive from this Service leadership of the manpower research program. Each Service designs its program in light of its special interests and concerns. It is frequently unaware that one or both of the other Services may be concerned about much the same problem and that a joint program with wider sweep and more resources might prove more productive. The senior staff from each of the Services emphasized the desirability, in fact, the necessity, of continuing the Service leadership of the research programs so that their projects could be responsive to their unique problems and environment. They gave little attention or weight to the fact that such a Service focus carries heavy costs, including relative isolation, sub-optimal scale of effort, and loss of stimulation that would result from active interchange with the other Services. The Task Force was sympathetic to the view expressed by the Services that each faces and has to solve unique problems, but it did not agree that this justifies total independence in the design and implementation of their manpower research programs.

Domination by the Services is one critical aspect of the manpower research structure; another is that all of the funding and control is exercised through the research and development component. While we were startled to learn that broad policy determinations about the direction of manpower research are made by scientists and engineers whose primary competence and concern are in the field of weapons, we found that in fact the substantively interested agencies--manpower and personnel elements--have ways of making their influence felt.

Moreover, we learned that despite the limitations inherent in a system in which final control is exercised by R&D, there are compensating advantages, such as, for instance, when the modest budgetary request for manpower research is subsumed within the much larger total for all R&D. However, the tie-in of manpower research with the general R&D effort has led to the predominance of the laboratory model as the principal agency for carrying out manpower research. Since this model was firmly established within the general R&D framework, it has independence and resilience. For instance, senior staff who became restive about manpower research and its potential payoff had to recognize and respect the fact that the primary mission of the laboratory is to contribute to basic research or to exploratory or advanced development. They did not feel at liberty to assign the laboratory

staff to short-term study efforts that would detract from their long-range R&D efforts.

Despite these sources of strength in the laboratory model, it has weaknesses as the critical institution involved in manpower research. Since most of the laboratories are distant from Washington, the linkages between the policy and planning staffs that need the results of the research and the scientists and supporting staff who prepare them are often tenuous. This has several undesirable consequences. The laboratories often receive inadequate guidance from headquarters with the result that they continue to follow the same lines they have pursued in the past. However, they have not been immune to disturbance from the outside: the classic case is the Human Resources Laboratory of the Air Force located in the San Antonio area which has been repeatedly pulled in different directions by disagreements among key elements of the Air Staff. The fact that many of the laboratories are thousands of miles from Washington reinforces the importance of better guidelines and liaison between headquarters and the research effort in the field.

Another untoward consequence of the lack of a continuing and close relationship between top policy staff and laboratory researchers has been the difficulties the scientists have had in obtaining support to insure that a good research result is translated into new policies, programs, and procedures. Part of this difficulty stems from the rapid turnover of personnel in headquarters whereby the interested officer is reassigned before the research is completed, but part of it lies in the weak liaison.

A related difficulty--and surely among the most critical--is the failure of the personnel policy and planning staff to take the time and trouble to identify and specify the key issues on which they require research inputs. Moreover, they are often not sufficiently sophisticated and knowledgeable about the potentialities and limitations of manpower research in general or about the capabilities of their research arm to formulate realistic requests and to modify and adapt them in terms of what their research staffs define as feasible within the time and resources available.

At present liaison between headquarters and the researchers takes place primarily through technical channels; manpower specialists at headquarters communicate, usually informally, with their counterparts in the field. While this is desirable and even necessary, the more active involvement of senior military staff is essential if the field is to become increasingly responsive to priority policy issues.

The dominance of the R&D laboratory model exercises a major influence on both how the manpower researchers design their projects and how the staff assesses them. If the project can be fitted into the categories that are used in weapons research, if the specific objectives can be delineated and the specific methodologies described, the prospects are greater that the project will be approved and funded. While it is fitting and proper that manpower researchers, like all other researchers, outline their proposals, indicate how they plan to proceed, and answer the questions of reviewers, it does not follow that the closer they approximate the model of the physical sciences the better their project, the greater the probability of success. In many cases the reverse is true.

On the basis of our own critical review of the best of the manpower research studies that the Services submitted, we are convinced that much of the work is narrow in focus, carried out within a straight-jacket of quantitative measurement, and has marginal impact on manpower management. In our opinion one important reason for these deficiencies is the realization of the researchers that those with power over the purse are more likely to fund research that approximates the laboratory model.

As noted earlier, about 3 out of every 5 dollars of research funds for human resources are spent for studies of manpower selection and training. However, a high proportion of these efforts can be defined as "research" only under a liberal definition. A substantial portion of the program is concerned with revising and refining key selection and assignment instruments and to collecting data to extend the research on existing instruments.

The military departments took the lead in these areas of personnel research during World War II and made further important advances during the early post-war period. But we strongly believe that there is a serious imbalance at the present time--and for years past--between the proportion of the total manpower research program that the Services devote to these problems and the strikingly narrow way in which they approach them. For instance, the Services have not updated several important selection and assignment instruments to take account of the changing composition of the demographic pool.

But these comments about the quality of work of the current research effort must not obscure the fact that at its best the manpower research carried on within the DoD is very good with respect to problem selection, methodology, and payoff. The Army has contracted with HumRRO to undertake a large part of its total manpower research.

HumRRO is a nonprofit organization which until recently worked almost exclusively for the Army but which has now broadened its clientele. HumRRO has concentrated on research on training and its record of performance is good.

Among the research studies which we reviewed, one of the most impressive was the investigation into the need for a second pilot in the F-4. Initiated at the request of the Secretary of Defense, the research team designed and carried out a clean-cut study which showed that a navigator could fill the second seat as well as a pilot and this finding enabled the DoD to save at least in the short-run about half a billion dollars which would otherwise have been spent for additional pilot training.

We identified many other sources of strength in our selective review of manpower research. Each of the Services has recognized the importance of developing some expertise in manpower modeling so that it can make greater use of the computer for simulation and forecasting.

It appeared less important to us to attempt an appraisal in depth of the current manpower research program than to gain sufficient familiarity with its strengths, weaknesses, and potentials to point the directions where it could be strengthened. Our analysis and recommendations for strengthening the research program are the primary concern of the following two chapters.

The key points that have emerged from this overview are:

- OSD and the Services spend \$37 million on manpower and manpower-related research. This amount is not inconsiderable when contrasted with civilian expenditures.
- On the other hand, this level of expenditure shrinks into relative insignificance when juxtaposed with the total annual defense manpower cost of almost \$40 billion, and an R&D expenditure on weaponry of about \$7.2 billion.
- Each Service spends for manpower research in the neighborhood of \$10 million annually, of which about 60% of the combined total is devoted to the fields of selection and training.
- While the agencies of the Office of the Secretary of Defense spend almost \$1 million annually for research, less than

10% of this sum went to the Office of the Assistant Secretary of Defense, Manpower and Reserve Affairs, in Fiscal Year 1971.

- The Services exercise most of the leadership and responsibility in the area of manpower research. The Office of the Secretary of Defense has relatively little impact on the shape and direction of the research efforts.
- Each Service concentrates on its own problems with little effective interchange with the other Services. Many of the projects which they undertake are sub-optimal.
- Funding and control of manpower research is handled by the R&D channel where the leadership is oriented to physical science and engineering models.
- Liaison is generally poor between senior staffs in manpower policy and planning positions and laboratory-based research personnel, with the result that much manpower research is not directed toward solving priority problems.
- The research record of the Services is mixed. Much of the efforts are devoted to improving existing personnel instruments, but the Services also approach more complex issues from time to time and some of these projects have a high yield in terms of new knowledge and improved policies.

4. In-House Reforms

In the preceding chapters attention was called to the following structural and substantive problems that must be soived in strengthening the manpower research capabilities of the Department of Defense:

- The absence of a broad program of leadership in the Office of the Secretary of Defense.**
- The fact that each of the Services conducts its own research with little interchange or cooperation with each other on common problems.**
- The dominance of the R&D organization over manpower research, although its primary concern and competence are in science, engineering and weapons systems rather than in relevant manpower disciplines.**
- The lack of effective articulation between the senior staff who need the inputs from manpower research for policy and programming and the researchers who are stationed in the field.**
- The disinclination of the Services to open up for probing inquiries certain conflict-laden areas, such as race and drugs.**
- The continuing concentration of the research staffs on narrow technical problems, primarily in the fields of selection and training, in which they have already developed sophistication.**

These are some of the major problems that surfaced in our preliminary analysis of the condition of military manpower research. In this chapter we will focus on a limited number of internal issues affecting the quality of the research effort with an aim of suggesting how its effectiveness could be improved.

When consultants review the operations of a large organization, it is customary to suggest how improvements in structure can lead to more effective outcomes. We prefer, however, to reverse the procedure and concentrate initially on substantive matters. The essence of good research is the selection of good problems and the competence to study them.

Our first and strongest recommendation about the overall direction of the current efforts of OSD and the Services is that a substantial increase in absolute and relative efforts be directed to what might be called "macro-manpower studies" as distinguished from the "micro" investigations which today preempt most of the budget.

We distinguish macro from micro studies in terms of research objective, policy application, and the organizational level required to implement the results. Accordingly, in our usage, macro studies related to research inquiries that are of concern to all four Services, that can result in significant economies or improved efficiency in the use of resources and that will have impact on policy decisions at high levels.

In contrast, micro research is characterized by its responsiveness to the needs of lower level operational or staff personnel, and by the fact that its results will have potential application to only one Service or one organizational element, and will not lead to major policy changes.

As the Task Force sees it, the Department of Defense urgently needs the inputs from research as it faces such broad challenges as the best ways to reduce its present personnel strength; the alternative uses of the personnel budget to facilitate recruitment and retention of a volunteer force; the best ways of altering the composition of their manpower resources between officers and enlisted men and among military, civilian, and indigenous personnel; the implications for career retention and operating effectiveness of different rotational policies; the tradeoffs between minor gains in technological efficiency of new weapons and the added costs of training and maintenance of new systems; the advantages that might accrue from greater flexibility in assignment if men were trained to acquire a broader range of skills; the preference of career personnel for high, current versus delayed benefits. These are a few of the priority questions of a macro nature which OSD and the Services need to explore.

Each of the Services currently devotes some effort to the study of such macro problems, but we believe that an increase of considerable magnitude along this macro axis will be required in the years ahead if the manpower managers in the military are to exercise more effective control and improve the quality of their plans and programs in an area on which the Defense Department spends over half of its total budget.

To a marked degree the success of an expanded effort will require the investment by the Office of the Secretary of Defense and the

Services of more research funds to improve current methodologies. Improvements in theory must go hand in hand with improvements in systems analysis since both are essential for the strengthening of macro manpower studies. The effective exploitation of computer technology depends on the development of software. Concomitantly it depends on research in modeling methods and techniques for data analysis.

Greater emphasis on macro studies is one recommendation; research into methodology and modeling a second; the third substantive recommendation relates to the new mix of research personnel. The outcome of any research effort is limited by the range of skills and competences of the participating staff.

Throughout the entire Department of Defense, psychologists account for by far the largest number of professional staff. Moreover, they are heavily concentrated within a relatively narrow sub-sector of psychology; most of them have been trained as experimentalists, predominantly in learning theory and testing.

The professional research staffs do not have broad representation from within the entire field of psychology and they are conspicuously weak when it comes to the allied disciplines of economics, sociology, political science, organizational theory, operations research, computer science, and manpower. A long-range program for strengthening military manpower research must give priority to broadening and strengthening the research personnel.

Now to problems of structure: We heard complaints from the senior officials responsible for the management of human resources laboratories about the following personnel dilemmas for which they had been unable to find satisfactory answers.

Their most serious complaint related to the aging of their staffs and the impossibility of their taking constructive action because of the protections afforded career personnel by the Civil Service Commission. The analysis prepared by our staff revealed the following distribution in years of federal service of supervisory personnel in human resources laboratories: 42 had 20 or more years of service; 13 had between 15 and 20 years; and only 15 had 14 years or less. The median for all division chiefs and above was 21 years.

The danger of an aging research staff in corporate laboratories is increasingly recognized to be a major deterrent to high productivity and, even in the absence of the protections afforded by a Civil Service Commission, solutions come hard. We have no easy answers. But we

desire to underline our conviction that laboratories which aim to remain in the forefront of their discipline must find ways of bringing in new people and permitting them more scope as they begin to prove themselves. There is a double danger from the older person who may no longer be vigorous: he may not produce and he often blocks others from doing their best.

We were informed that a related weakness from which some of the laboratories suffer is their inability to attract able young scientists in part because of adverse geographic location. Able men--at least during the tight labor market of the 1960's--did not want to settle down in out-of-the-way places far distant from an intellectual center. One of the principal Service laboratories, for example, has had the position of chief civilian scientist open for more than two years.

We learned early in our deliberations that one of the preconditions for a substantially strengthened manpower research program in OSD agencies and the Services is the senior commanders understanding the need for and the potentialities of more effective manpower management and the assistance that manpower research could make thereto. As long as those in positions of authority are not acquainted with the new approaches to the management of large organizations, particularly manpower management, they are unlikely to be sympathetic to manpower research and are further disinclined to support and use its results.

A series of remedial actions might be undertaken: on the basis of analysis of one of our members, we are convinced that more attention should be directed to manpower management and research at every level of schooling within each Service as well as within the senior schools operated under the auspices of DoD. Secondly, the Services might review and consider making adjustments in the fields of specialization for the more than 5,000 officers (Fiscal Year 1970) whom they support in full-time university programs.

It would be desirable if more officers receive advanced training in manpower management and manpower research and if greater efforts were made by the Services to assign them to duties that would utilize their specialized training. Finally, OSD agencies and the Services might periodically sponsor symposia or provide other opportunities whereby senior manpower staff could learn about advances in management and research.

In seeking for explanations for why so much of the manpower research undertaken by the Services appears to follow well grooved

paths, we noted what appeared to be substantial self-sufficiency. In some program areas, the scientists in the Services come together quarterly to exchange information about their plans and progress; many belong to national professional organizations and participate in their meetings; others are active members of local or regional professional groups. Nevertheless, we believe that many manpower and personnel specialists within the military tend to go their own way, not sufficiently influenced by the trends and forces in the larger scientific community.

For instance, some never publish and others publish only occasionally in scholarly journals; only a few hold adjunct positions at neighboring universities; they do not appear at many formal or informal civilian meetings or at conferences in which they might be expected to participate. While pressure of time and lack of travel funds hold part of the explanation, we consider that the putative gains from closer and continuing associations with the civilian research community have probably been underestimated.

For this reason we strongly urge that OSD and the Services review the formal and informal mechanisms that now exist for assuring a steady interchange between civilian consultants and the professional and managerial staff in the military manpower arena; when they do not exist, it is urgent that such mechanisms be put into place. In our view, there is little prospect of strongly energizing the military manpower research effort except through much closer linkages between the DoD's staff and the civilian research community.

We come now to a series of interrelated recommendations that bear directly on the structural changes that are required to strengthen the military manpower research effort. A logical place to begin is to repeat that at the present time there is no agency within DoD which is adequately staffed to oversee the development, implementation and coordination of the total manpower research effort. The Director of Defense Research and Engineering has a veto over the Services' research plans; the Assistant Secretary of Defense for Manpower and Reserve Affairs can occasionally coax or wheedle one or more of the Services to undertake a project which he considers important. But the ineluctable fact is that each Service seeks its own funds from Congress and spends them on its own parochial interests. Within the OSD and the Services, as we have seen, the critical authority over manpower research is exercised by the senior staff in the R&D area.

Following are our principal recommendations which, if implemented, would go a far distance toward putting in place a structure

that would be much more responsive than the present one to supporting a stronger and more relevant manpower research effort:

a. The staff capabilities of the Assistant Secretary of Defense for Manpower and Reserve Affairs must be strengthened along two major axes. A larger number of technically qualified personnel are required if he is to oversee and coordinate the overall manpower research effort of the Defense Department. And he also has need for a small group of manpower analysts with competence in macro studies and an appreciation of how manpower research can contribute to improving the quality of planning and policy studies. Staff continuity can greatly enhance the productivity of such an analyst group by enabling its members to draw on their accumulated knowledge of data bases and the results derived from earlier studies.

b. The Director of Defense Research and Engineering, in association with the Assistant Secretary of Defense, Manpower and Reserve Affairs, should establish a DoD Manpower Planning and Review Group with a general aim of developing an on-going manpower research program responsive to the changing functions of the Defense Department. Among the primary tasks of this group, on which representatives from other interested OSD agencies, such as Systems Analysis, might serve, and which should include representatives from the Services, is the delineation of common research problems, implementation approaches stressing joint or coordinated projects including cross-assignment of research personnel, use of multiple Service facilities, and similar actions.

c. To provide leverage for this new instrumentality the Task Force recommends the following interim budgetary actions for Fiscal Years 1973 through 1975:

1. Notice by Director of Defense Research and Engineering to the Services that their Service-specific budgets for manpower research will be kept relatively constant.

2. Substantial increases in funding for manpower research of the order of not less than half of the 25 percent increase for Fiscal Year 1972 for each of the next three years to be allocated to ARPA and the Assistant Secretary for Manpower and Reserve Affairs.

3. Notice to the Services that a considerable part of these additional research funds will be put out for macro

studies on the basis of competitive bidding from agencies within and outside of the Department of Defense.

d. To facilitate a better articulation of the entire research program and to insure that priority substantive concerns of the manpower managers are reflected, the Director of Defense Research and Engineering, together with the Assistant Secretary of Defense, Manpower and Reserve Affairs, should issue instructions that each Service manpower research program will be funded only after it has been commented upon by the Assistant Secretary for Manpower in the Service after consultation with his senior military and civilian advisors.

We believe that the recommendations advanced above, if accepted and implemented, hold promise of adding considerably to the effectiveness of the current manpower research effort in the military and that this strengthened effort will provide one of the foundations for more effective manpower management. In brief review, here are the urgently required changes:

- Clear assumption of leadership by OSD (Director of Defense Research and Engineering and Assistant Secretary, Manpower and Reserve Affairs) of the total manpower research effort through control of new research funds and the effective review and coordination of Service programs.**
- Systematic efforts through education and training to broaden and deepen the understanding of junior and senior commanders of the new opportunities for improved manpower management and the potential contribution of manpower research to this end.**
- Strengthening the scientific manpower resources in OSD and the Services by broader recruitment among the spectrum of human resources disciplines, and greater on-going interchanges with the civilian scholarly community.**
- Expanded research programs of "macro" studies and more funding for improvements in methodology.**
- Augmenting manpower research staffs in ARPA and the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs to enable them to cope effectively with their new responsibilities for planning and coordinating the Department of Defense's enlarged manpower research efforts.**

5. External Relations

The core of research is free inquiry and interchange among members of the scientific community. Even the most talented man needs the stimulation and criticism of his peers if he is to move from one successful investigation to another. The sure and certain road to research sterility is isolation, self-imposed or enforced.

We have noted earlier evidence which suggests that the linkages between the military manpower researchers and their civilian counterparts are less than close. Specifically, attention was called to the following:

- The in-breeding of the laboratory staffs is reflected in an average of more than 20 years of federal service for those in supervisory positions.**
- The Services face budgetary and other difficulties in their attempts to recruit able men from the civilian community.**
- Few officers are sent to universities for full-time study in the manpower field.**
- Less than optimal use is made of civilian consultants in connection with the design, implementation and review of military manpower research.**
- Military manpower researchers infrequently publish their research investigations in scholarly journals.**
- Military manpower researchers participate too infrequently in conventions, conferences, and symposia in the civilian community.**

The foregoing recapitulation has been presented not as a broad criticism of how the military research program is conducted, but to highlight the fact that if continuing and intimate interchange among all members of the research community is desirable, past and present practices in DoD research elements leave considerable room for improvement. Although during the last few years many academicians have not been willing to undertake research on military problems this will probably change after American troops leave Vietnam.

Although universities represent the most important external environment with which DoD researchers should seek to strengthen their relations, there are other important relationships, specifically other federal departments with research arms, foundations and various nonprofit organizations that have a demonstrated or potential interest in military manpower research; management research centers that are seeking new knowledge in organizational theory and performance; corporate enterprises with manpower and personnel research departments; and military manpower planners in foreign countries whose armed forces have demonstrated special strength.

While the periodic and particularly the systematic cultivation of such external relations require time and effort, we strongly believe that OSD and the Services have a long way to move along this axis before they run the risk of approaching or passing the point of diminishing returns.

Let us consider the relations of OSD and the Services with the cognate federal agencies. DoD has worked out an arrangement with the Office of Education whereby it has been able to piggy-back on recent surveys of American youth conducted at the University of Michigan's Survey Research Center. With the heightened Congressional concern over drugs, DoD has established a relationship with the National Institutes of Health which is likely to be strengthened in the near future now that the initial planning has been completed and the investigatory work can proceed more rapidly.

From time to time DoD has sought the assistance of the National Academy of Sciences in assessing the scope and direction of the work in which it is engaged or should be engaged in the behavioral sciences, including manpower research. The most recent illustration (February 1971) is the report, "Behavioral and Social Science Research in the Department of Defense: A Framework for Management," which was the result of work carried out by the Division of Behavioral Sciences of the National Research Council of the National Academy of Sciences.

Other levels of relationship are found between the working members of the research staffs of the OSD and the Services who share common or overlapping interests with the staff of the Bureau of Census, and recently DoD has cooperated with the Department of Labor in operational research and follow-up studies seeking to track the flow out of the military back into the civilian economy of certain groups of veterans.

But these instances of cooperative research planning and implementation between DoD and one or another federal agency should not

obscure the dominant finding that there is little interest in and less commitment by OSD and the Services to expand and strengthen cooperative research relations. Even if the military were to shift its stance and take the lead in defense-related research, it might encounter difficulties in finding the counterpart personnel with whom to work in the civilian agencies. But the relative size of the DoD budget and staff make it difficult for the civilian agencies to take the initiative. DoD must take the lead and to date it has not, surely not on a planned and sustained basis.

In our view there are several manpower areas where cooperative relations between DoD and other federal agencies are clearly indicated. For instance, the OSD and the Services clearly should seek to work with the Bureau of the Census and the Department of Labor in on-going studies of the changing size, structure and quality of the demographic pool from which it draws its manpower. The civilian agencies have considerable expertise in demographic and labor force studies. But their analyses could be broadened and deepened if they become privy to the special concerns of OSD and the Services and become involved in joint studies and research.

OSD and the Services should be increasingly concerned with how well they build in the skills and potentials of the young men who come on active duty and particularly the career consequences of the training and experience that men acquire while on active duty. During the last years there have been the beginnings of a research effort that has sought to probe questions such as these, but neither the military nor civilian arm of the federal government has adequate knowledge about these issues which have importance for military efficiency, the national budget, and the career development of individuals.

We recommend that the senior DoD officials who have the responsibility for shaping and evaluating the military manpower research program should consider the potentialities of much closer liaison and cooperation between the Pentagon and the relevant civilian manpower research elements in the federal government.

OSD and the Services should explore the possibilities of making use of machinery for the support and encouragement of manpower research that exists and is functioning well in some of these civilian agencies. Specifically, the OSD and the Services might make modest sums available to the Dissertational Grant mechanism of the Department of Labor for the support of doctoral or exploratory research studies that have a direct bearing on the work of the Defense Department. The fact that such a mechanism is in place and has a demonstrated record

of functioning well underscores the possible advantages to DoD of using it rather than going through the cumbersome effort of duplicating it.

The Defense Department might also explore establishing closer working relations with the research arm of such agencies at the Office of Education, the National Institute of Mental Health, the Equal Employment Opportunity Commission, the Office of Economic Opportunity with an aim of participating jointly with them in research investigations that have, or could have, an important military component.

As previously noted, the Army has relied on HumRRO to carry out most of its manpower research. The Navy has made some use of the Center for Naval Analyses. The Air Force has lately placed manpower research contracts with RAND. OSD has made use of the staff and facilities of the Institute of Defense Analyses. From time to time OSD and the Services have relied on other nonprofit and profit organizations to carry out manpower and manpower-related research investigations.

Several points are worth noting about these relations. Starting several years ago, Congress placed a ceiling on the level of funding that OSD and the individual Services could allocate to Federal Contract Research Centers (FCRC's). This has made it difficult, for instance, for the Army to expand its reliance on HumRRO and has in turn led to legal changes in the organization of HumRRO to enable it to broaden its clientele.

Secondly, until the recent past, major military contractors such as RAND, IDA, CNA, have shown little interest in and had built up only a modest capability in the manpower and manpower-related areas. Recently they have recognized the desirability of undertaking more research in this area and they adapted some of their sophisticated computer and modeling techniques to work on manpower forecasting and related problems. Their staffing is still limited but they are moving to strengthen it. The major danger they face is to assume more transferability of theory and technique from natural to human resources than is in fact justified.

On the other hand these major defense research contractors have the clear advantage of an intimate knowledge of the Services, their problems, and their methods of operation. Hence for the long pull, we believe that it is sound policy for defense funding to facilitate the strengthening of the manpower research capabilities of these proven research establishments.

Even before the domestic tensions engendered in part by Vietnam, the educational and research foundations, with the single exception of the Russell Sage Foundation, evinced little or no interest in the problems of the military despite the critical role that the military plays in the late adolescence and early adult experience of most American males.

We call attention to this phenomenon as a further reminder of the deep-seated tendencies towards isolation that are characteristic not only of the Armed Forces but also of leading institutions in civilian society. From the viewpoint of strengthening research in military manpower it would surely be desirable to encourage the principal foundations interested in research in human resources to realize the potentials of cooperating with the Defense Department in seeking new knowledge about the characteristics and performance of the young generation of Americans.

The Defense Department is the prototype of the large organization. If it is studied and evaluated in these terms, it would have much to contribute to a better understanding of the structure and operation of other large organizations that have come to dominate American life--corporate, labor, education, medical, political.

While the field of management has blossomed both as a subject of university instruction and as an arena in which consulting firms have multiplied, the total research effort directed to the analysis in depth of the structure, operations, and leadership of large organizations has been modest. This can readily be explained by the disinclination of those in positions of power in large organizations to permit research scholars to study their organization for fear that their inquiries and results might prove disturbing to the work force and might damage the image of the organization. Yet in light of the extent to which a modern society depends on large organizations for its well-being, security, and progress it is clearly desirable to learn more about their functioning.

The Department of Defense has an important stake in research investigations concerned with large organizations, as do large private, nonprofit civilian and governmental organizations. We were not able to go beyond identifying this subject as an important one for future research. We believe that research into the structure and functioning of large organizations, military and civilian, should receive priority.

Because of the difficulties of eliciting the cooperation of the key organizations and personnel that could alone make it feasible to initiate such systematic research, the Task Force recommends that the Department of Defense, perhaps after consultation with the Office of

Management and Budget and a nonprofit research organization such as the Brookings Institution, might play a part, even if it does not take the initiative, in stimulating a research effort directed to the analysis of large organizations.

We have singled out large organizations as an arena for special study because we are convinced that close linkages exist between the way in which large organizations are structured and operate and the ways in which they attract talent and make use of skills. Considerable evidence points to the fact that all large organizations, military and civilian, tend to underutilize their manpower resources.

A related, more modest proposal which the Task Force recommends is that the Department of Defense hold a conference, annually or bi-annually to which it invites representatives of major profit and nonprofit organizations to exchange information about the manpower research which each has under way and to assess the extent to which such research can contribute to improved manpower policies and programming. It might well turn out that the Department of Defense would be a major, if not the major, contributor at such a conference. But it is also likely that it would receive important leads which it could use either in its future research or in its manpower programming activities.

Such regularly scheduled conferences would provide the stimulus for the Department of Defense to undertake certain types of manpower research jointly with a consortium of private organizations. For instance, OSD and the Services confront problems in such areas as occupational classification, personnel evaluation, retirement benefits--problems with which many large private employers are also struggling. There is good reason to believe that joint research projects involving organizations in both military and civilian environments might prove more productive than investigations limited to only one setting.

Another subject that could prove valuable to OSD and the Services through feedback leading to policy changes would be selective follow-up studies of career officers and enlisted specialists who decide to leave the military prior to retirement. Such studies could best be carried out as collaborative efforts between DoD and civilian contractors.

OSD and the Services have regular mechanisms for keeping in touch with the military manpower research of nations with which we are allied as well as for trying to keep informed about developments in the military forces of potential opponents. It appeared to the Task Force, however, that while these formal approaches have much to commend them, OSD and the Services have not made special efforts to study

foreign experience in depth with an aim of determining whether particularly successful manpower approaches could directly, or with modification, be adapted for U.S. forces. Illustrative of the types of questions that might justify studies in depth are the relative rejection rates of selectees among high income countries; the military training of persons with limited education; methods for dealing with aberrant behavior such as homosexuality; the use of female personnel; and methods of officer evaluation.

Having called attention to a number of different ways in which the OSD and the Services could strengthen their external relations and thereby add to the efficiency of their manpower research, we come now, in conclusion, to the most important of all--the forging of closer ties to the universities. We have earlier noted that the last years have not been conducive for establishing, and less for strengthening, the ties between the Department of Defense and the centers of academic excellence, but we also noted that the extent of antagonism between the two should not be exaggerated and that it is likely to diminish as American involvement in Vietnam is reduced.

No matter what the atmosphere is or will be we see no alternative but for the Department of Defense to pursue the following lines: to send more career officers for full-time study in manpower to such centers as Princeton, Harvard, Wisconsin and others which today have strong faculties and lively research programs; to support through grants and contracts manpower research studies that junior and senior professors want to undertake which have a direct bearing on the mission of the Defense Department; to invite leading members of the academic community to play a more active role as consultants to the military manpower research program both in Washington and in the field; to consider selective funding at a limited number of institutions where the staff indicates a desire to make military manpower and related subjects a part of its on-going research program. By these and other ways, OSD and the Services should seek to tap into the mainstream of academic manpower research and training and in the process seek to encourage these institutions to study defense and defense-related problems.

Clearly, the relations of the military to the university should not be treated as a simple trading relation in which defense dollars buy academic talent. But neither can academicians ignore the realities of our defense effort, evidenced by 3 million men in uniform, \$40 billion of annual expenditures for manpower, the critically important security tasks which must be performed and the unique laboratory provided by the Services.

The nation looks for greater efficiency and effectiveness from the Department of Defense. The DoD in turn must rely on a broadened and strengthened research effort to meet this challenge. And as we have argued throughout this chapter, the Task Force believes that in strengthening their research arms, OSD and the Services will come into a closer working relation with many external sources, including most importantly, the academic community which is the center of the effort to advance the frontiers of manpower research.

The following themes have been developed above:

----The Department of Defense should extend and strengthen its relationships to the outside research community to insure that its own work is improved and fructified by the most recent advances in theory and technique.

----Specifically, OSD and the Services should aim to accomplish the foregoing through:

Establishing closer working relations with the manpower research agencies of the federal government.

Strengthening the manpower research capabilities of major defense research contractors through long-range funding and related efforts.

Developing ongoing relationships with large civilian organizations for the more effective interchange of the results of manpower research.

Expanding its evaluations of the military manpower experience of foreign countries whose solutions may have relevance for the United States.

And, most importantly, exploring how to establish a sound relationship with the principal university and related manpower research centers.

6. The Military as a Human Resources Laboratory

Social scientists explain the relatively backward state of their disciplines by pointing out that, unlike their confreres in the physical sciences, they are unable to use the laboratory for controlled experiments. It is an essential quality of societies that respect the individual and are determined to protect his freedom that they permit no experimentation on human beings without their consent.

There is a further difficulty confronting social scientists who seek to experiment even when they are able to obtain such consent. Since changes in human behavior are the outcome of interactions between individuals and the environments of which they are a part, the experimenter needs to control the environment. But such control is not feasible in an open society. The nearest approximation to a controlled environment is a protective situation such as a hospital, a boarding school, a prison. But the number of persons in such environments is usually small and they differ in major respects from the population as a whole. The only exception is the military which, when service is compulsory, has under its control for a number of years a representative cross-section of the young male population. It is this situation that makes the Armed Forces a unique laboratory for the study of human behavior.

Despite this uniqueness, its potentialities for research have been neglected. With priority missions to perform, senior commanders have been understandably loath to devote resources to studies, the results of which are unlikely to contribute to short-term outcomes. Moreover, the military has been sensitive about invading the soldier's privacy without his knowledge and consent. In addition, the military managers, similar to the managers of other large organizations, have been concerned about what the research results might disclose about their organization's performance. There is always the danger that the research findings might reflect unfavorably on them.

For these and other reasons, the military has not adopted an open stance toward broad-scale manpower policy research. The research it has undertaken has been closely geared to improving a narrow aspect of current operations. Moreover, it has preferred to keep direct control over the research process, thereby insuring that if the results are unfavorable they will not be broadcast. In the last thirty years there have been only two large-scale research investigations: The American Soldier (4 volumes) by Stouffer and his associates, used

survey data from World War II to trace the linkages among the attitudes, behavior, and morale of soldiers and their units; and Ginzberg and associates' investigation, The Ineffective Soldier (3 volumes), based on World War II records and follow-up questionnaires about the determinants of individual and group performance.

This chapter will review briefly the range of research problems which, if studied in depth within the unique military environment, would be likely to yield important new knowledge that could contribute not only to improved management of the Armed Forces but also carry important lessons for civilian society. For schematic purposes we will review the principal stages in the flow of personnel through the military from selection to separation.

The military, like every large organization, has paid considerable attention to refining criteria for selection. Its aim has been to accept for service only those men who have the highest potential for successfully completing training and serving satisfactorily on active duty. In years past the principal screening device used by the Services was the Armed Forces Qualification Test which was constructed to assess a man's aptitude for learning how to serve effectively on active duty. Recently the Services have added a second instrument aimed at broadening its assessment by evaluating the selectee's specific skill aptitudes. Further refinements include taking into account whether a man has completed high school, a criterion used as an indicator of motivation and adjustability.

Several years ago the Services were directed by the Secretary of Defense to lower the passing score on the Armed Forces Qualification Test and to accept men whom they had previously rejected (Project 100,000). The Secretary of Defense also gave instructions that the progress of these men with low aptitude be carefully monitored so that the Services could learn from the experiment.

It is not necessary for the purposes of this chapter to review the research findings and the interpretations that have been made of them. It will suffice to say that the follow-up of Project 100,000 men has been one of the most ambitious efforts of the Department of Defense to use research to gain new knowledge about its selection procedures.

Nevertheless, the Services still know too little about such critical dimensions of selection as the effect of different types of delinquency or criminal record on a man's suitability for military service; factors other than high school graduation that might provide a clue to a man's motivation and adjustability in the Service; the potential of

adjusting cut-off scores on the AFQT to take account of differential educational achievement and cultural variations in the several regions of the country.

The Services have considered these and related aspects of selection, but they have not been able to research the problems in sufficient depth to arrive at definitive answers. In light of the critical role that selection plays in the life and operations of every large organization, it would clearly be of advantage to the country at large if the Services were able through research to improve their criteria, particularly as they relate to disadvantaged groups.

The Services must transform young men accustomed to following their own preferences and initiative into disciplined members of a group, responsive to authority, in the shortest possible interval. It was accepted doctrine for a long time in the Services--and in the Marine Corps it still is--that a quick, sharp break between a man's civilian past and his military future will result in a successful transformation. However, the Services lose a relatively high percentage of all new men during the first weeks and months of training. Some men early demonstrate their incapacity to adjust to the new environment. But the Services have undertaken relatively little research to assess the relative advantages and disadvantages of what might be called supportive versus shock techniques. We do know, however, that qualified young civilian workers often fail to hold their jobs because of lack of proper introduction or conflicts with unsympathetic supervisors. The British Army moved years ago to assign specially selected non-commissioned officers to new recruits on the basis of a demonstrated aptitude for helping men make the difficult transition.

The sizable manpower wastes in the military during the first weeks of service represent one illustration of the more general difficulties that people face in orientating themselves to a new environment. Clearly the Services are in a good position to set up and monitor different orientation approaches. To date they have not done so; at least they have not carried their experiments through to a definitive conclusion.

It has long been assumed that when individuals are able to participate in decisions affecting their work they are likely to do better at their assignments and be more satisfied with them. The Services have acted in part on this principle by promising certain enlistees that they will receive an assignment according to their stated preference. On the other hand, most of the time operational exigencies have forced the Services to distribute recruits to meet priority needs.

The role of assignment in work performance and satisfaction is a matter of critical concern for the military, which is repeatedly forced by a sudden operational necessity to meet new demands for manpower. But even within the context of such realistic pressures, it is often possible for an organization to take account of the preferences of its members. Whether the organizational effort required in offering more choice of assignment is worthwhile will depend upon the extent to which improved performance and personnel retention is found to be correlated with the individual's opportunity to have a voice in his assignments. This is one more researchable area to which the Services could profitably pay more attention. In addition, it is an area where the research results would have relevance for other large organizations which face much the same problem of balancing operational imperatives with personal objectives.

We have noted earlier that the Services spend more than \$6 billion annually on training and that, together with selection, training is a major focus of their on-going research efforts. The range of their investigations covers a wide area--from the use of simulators for pilot training to revisions of curriculum aimed at reducing unnecessary theory. One of the by-products of Project 100,000 was the removal of algebra and physics from the curriculum when it was found these subjects were not necessary for the student's eventual mastery of the skill required to operate standard electronic devices.

The Services have engaged in a great deal of imaginative research relating to their training missions. For instance, the Air Force recently moved to reduce reliance on classroom instruction in favor of more on-the-job training. The Army realized that sizable economies in training time could be achieved by loosening the instructional cycle so that individuals have more freedom to proceed at their own pace. The Navy has taken the lead in using computers in its instruction.

Although much of the training research which the Services have been carrying on has yielded valuable results, translated into improved personnel management, there are many opportunities still awaiting exploitation. Take the matter of computer-assisted instruction: while each of the Services has been experimenting in this area there is no single research effort, properly staffed and properly equipped, to explore the full range of possible uses of the computer from appropriate design of equipment to writing new training programs.

Without minimizing the successes that the Services have achieved, the Task Force believes that they can, and should, do more along such lines as determining the optimal balances between classroom

and on-the-job training; the closer correlation between classroom theory and later use of theoretical knowledge on assignments; sequencing of training and job assignments; and many other critical questions such as motivation to learn a skill and retention and enhancement.

In light of the Defense Department's heavy expenditures for training and further, the even larger sums spent by the civilian sector on training, new knowledge garnered from research could lead to large savings in human and dollar resources. Against this background of potential gain it must be concluded that OSD and the Services should seek to develop and implement a more comprehensive research program.

The effectiveness of any training effort depends in considerable measure on the occupational structure and the ease and difficulty people encounter in moving from one job to another, from one career line to another. The military perforce has its own occupational structure--in fact, each Service has its own. The occupational structures in the military are not directly aligned with those in the civilian sector. In fact, to talk about the civilian occupational structure is misleading because each major industry--electronics, automotive, medical--has a unique structure; to some extent each major company within an industry has its own structure. Yet trainees and workers must make their job decisions with an eye to moving from one place in the occupational structure to another, and every training system must be geared to the jobs and careers that will be available to its trainees when they complete their courses.

There is often an imbalance between the range of the training that a man receives and the number of assignments for which he will be qualified. The military, by nature of its mission, must frequently move men into assignments for which they have not been trained. Consequently, the military needs to learn more about the ways in which different parts of the occupational structure are or could be interrelated.

The Marine Corps is currently engaged in a major occupational study but the total research effort of the Services has been and remains far below optimum. The subject has added importance, first, since the Services, like civilian employers, must move toward job enlargement in order to attract and hold men who are looking for interesting work and, secondly, they must play a part in assisting the re-employment of men in the civilian sector at the end of their military service. We noted earlier the national interest in the conservation of medical skills acquired by veterans who had served in medical assignments.

The payoff for every personnel system is performance. This underlines the importance of research directed toward that end. As a senior official of the Navy emphasized in his discussion with the Task Force, it would be highly advantageous for the Navy to know why certain ships perform strikingly better than others although there is no obvious difference in their equipment or complement. The official suggested that the differences must lie in the realm of leadership and indicated the desirability of research addressed to the question of differential performance.

The fact that so many military organizations are put together with the same resources and operate in the same environment as their counterparts makes the comparative study of unit performance much easier to undertake than in civilian life where comparability is harder to achieve. Despite the Services' repeatedly expressed concern with all aspects of personnel performance they have in fact devoted remarkably little effort to systematic research on performance, particularly group performance.

They have studied the performance of individuals and groups under highly adverse environmental conditions such as severe cold or jungle conditions. It is questionable, however, whether they have learned as much as they could from the different types of fighting in Vietnam. As far as the Task Force was able to ascertain, there was never strong support either in Washington or in the theater for a serious research effort aimed at maximizing what could be learned from the performance of men under battle and support conditions. The shortfall in this area probably resulted in part from the lack of adequate research planning prior to the acceleration in the fighting plus the difficulty of protecting non-combatant researchers in the field.

The Services have been concerned for a long time with officer evaluations, which form the foundation for promotion policy and the selection of the top leadership. Despite their concern, the Services have limited their research efforts to evaluative instruments which have repeatedly demonstrated their limitations because of the inclination of most officers to place those whom they are rating in the highest category to avoid handicapping them for advancement.

Although the Services have not improved their officer evaluations substantially, this is also true of civilian promotion procedures. However, the more important observation is the relatively modest efforts that the Services have directed to this critical area and their failure to adapt or modify some of the more important leads which have been opened up in recent years, such as assessment centers, evaluations by

others than the man's direct supervisors, and evaluations through special assignments.

We are not faulting the Services for failure to have found answers but rather for the inadequate investments they have made and the narrowness of the focus of the research they have pursued in an area which they recognize to be of substantial importance.

This chapter has sought to indicate by selective illustrations the many critical manpower and personnel areas where the military environment provides a superior setting for undertaking systematic research. The military has a natural laboratory within which to carry on manpower research since it exercises a high degree of control over both the individual and the environment in which he lives and works. In our opinion OSD and the Services should take much more advantage of this laboratory in the future not only because of the value of the potential research for raising their performance, but also because of the value of the research results for performance in the civilian sector. The Department of Defense should on its own initiative and, where appropriate, collaboratively with other organizations undertake more macro-investigations into a wide range of critical areas, the results of which promise important gains both to it and to the nation. Specifically, such macro studies should focus on:

- The logistics of selection
- Orientation and indoctrination
- Training systems
- Occupational analysis
- Performance, individual and group
- Officer evaluation and leadership

7. Research: Key to Better Management

The Task Force was impressed with the wide range of attitudes and reactions with respect to manpower research and manpower management that were revealed by those who appeared before it to discuss their problems. At one extreme were senior military manpower managers who believed that they and their colleagues had control over the manpower problems facing their Services; that when they needed new data or analyses on particular issues they could obtain reliable answers quickly from their staffs; that there was little point to the exercise in which the Task Force was engaged; the manpower management for which they had responsibility was under control and was resulting in sound and sensible outcomes that would continue to assure their Service the men and the skills they would require to perform their several missions.

At the opposite extreme was a young General officer who stated that almost all of the assumptions underlying his Service's manpower policies and programs were fundamentally awry from the viewpoint of the new challenges that his Service faces and the new type of enlisted men and officers who comprise the manpower of the future. He argued persuasively that unless the senior staff quickly recognizes the extent to which they are operating with obsolescent ideas and programs; unless they vastly expand their research efforts to deepen their knowledge and understanding of the environmental and personnel parameters within which they are constrained; and unless they demonstrate the flexibility to use the results of research to scrap and modify many existing personnel policies and procedures and innovate new ones that will be more responsive to the new reality situation, his Service and, for that matter, the other Services as well will be in serious plight. According to this General, the Services simply cannot meet their responsibilities unless they develop a new approach to their manpower.

Between these two extremes--complacency with the present manpower structure and Cassandra-like warnings that manpower policies must be completely and quickly overhauled and restructured--were the many other positions advanced by military and civilian personnel in senior assignments.

For the most part these witnesses acknowledged that important changes are occurring within the environment in which OSD and the Services operate and that these changes clearly point to a need for concern with manpower issues which they had earlier been able to ignore.

Secondly, they acknowledged that a stronger manpower research effort should prove helpful in enabling the Services to meet and solve these new issues. And finally they agreed that the interface between manpower research and manpower management must be improved if the Services are to derive the full benefit from a broadened and deepened research effort.

The Task Force will draw attention to some of the levers that currently exist or that can be developed to insure that a strengthened manpower research effort can make an optimal contribution to manpower management.

To begin with the Service manpower managers: they are strategically placed to further or retard the efforts that their organization will make in the field of manpower research just as they will largely determine whether the results of significant research are put into practice or left on the shelf.

While age and education do not appear to be the sole determinants of whether the Service manpower managers will support and implement manpower research, we have the distinct impression that time is on the side of the Services in that the men now reaching senior rank have been better prepared to understand the complexities of the manpower mission and to be more sympathetic to the potentialities of research to help them meet and solve their problems. The generation of the nonprofessional manpower managers appears to be on its way out. We believe that this same trend is also observable in large civilian organizations. However, we do not want to leave the solution to time alone. We believe that various steps can be taken to speed the rate at which defense manpower management is strengthened through manpower research.

One important lever is that the policy and planning staffs at OSD level can insist increasingly on studies and analyses in support of manpower proposals originating in the Services. When they are lacking or inadequate, as when the Air Force sought approval a few years ago for a vast expansion in pilot training, the Secretary of Defense and his staff should suggest the type of analysis or research that must be undertaken before the proposal is acted on. Because of the time elements that are involved it is a limited, not a general, answer to prod the manpower managers of the Services to be more research- and analytic-minded.

A preferred approach is that the concerned agencies in OSD have foresight about the surfacing of critical manpower issues so that

research is initiated in sufficient time and scope to make a contribution to their eventual resolution. This is embodied in our recommendation that expanded manpower research be initiated by OSD agencies, in terms of both the projects they fund themselves and, equally important, the influence they can exert on the manpower research planning of the Services, individually and jointly.

Among the other devices that can contribute to this end of assisting the manpower managers to become more interested in, supportive of, and responsive to manpower research are efforts to increase the formal orientation and instruction that commanders receive about manpower in Service and OSD schools; the institutionalization of manpower conferences or symposia at which manpower managers and researchers have an opportunity for more direct interchange; the involvement of civilian consultants in the design, execution and evaluation of manpower research programming; and through improving the continuity in technical assignments of well trained officers.

OSD and the Services engage in planning with a five-year lead time. We have learned from corporate experience that one of the best times to strengthen manpower management and to make a place for manpower research is when the organizational planners step up their demands for improved manpower inputs for the enterprise's five-year plan. There is every reason for the Defense Department to take this same approach. Among its other benefits is the establishment of a requirement that is clearly not geared to immediate policy decision-making but that encourages the manpower managers to take a longer look ahead and develop methods by which they hope to find the answers for some of the problems which will surface.

The annual updating of a five-year plan has the additional advantage of encouraging the manpower managers to invest more funds in manpower research which has as one of its critical objectives the development of a data base and the development of models which will facilitate many of the calculations they will have to make on a continuing basis. There is no certainty, of course, that the data and the models will yield the answers that the planners need but the annual revision of a five-year plan should contribute to strengthening both the data base and the manpower research methodologies. Moreover, it should also help to teach the important lesson that bright amateurs usually cannot develop as good answers as competent professionals. The Services have relied for answers to complex questions on intelligent staff officers who often do not have requisite theoretical background, do not control the relevant methodologies, and do not have access to adequate data

bases. There is, of course, a place for the generalist staff officer with broad analytic training, but he is not a substitute for the manpower specialist.

The military manpower managers of the 1970's confront the following changing parameters:

- The probable suspension of the draft which implies the Services' moving from a manpower surplus status to a manpower stringent position.
- A much higher relative cost of manpower, reflecting trends in the economy at large and reinforced by the added attractions that must be built into a military career if the Services are to manage without the draft.
- The radical changes in attitudes and behavior of young men with their new views toward authority, obligation, patriotism, leadership, work, and individualism.
- The increasing concern of the Office of Management and the Budget as well as the Congress with the high proportion that manpower costs represent of total Defense expenditures and the probability of a more receptive attitude on their part to Defense management proposals that aim to enhance defense efficiency at the same or lower personnel costs. Estimates for Fiscal Year 1975 forecast manpower costs at 63 percent of the Defense budget!
- The probability that the President, the Congress, and the nation will look increasingly at the Defense Department's activities, not only as they relate specifically to matters of national security but also with respect to their impact on the operation of the total society, spanning the gamut from the career and life chances of the individual to the economic well-being of communities.

If these and related changes occur, and we believe that they will, both the OSD and the Services will face a host of manpower challenges which can be answered only through a strengthened research program that is translated eventually into new policies and programs.

In the following paragraphs the Task Force will sketch a few of the challenges which we have recognized during the course of our deliberations. There are, of course, many more that could be delineated.

But the following catena should provide suggestions to both the manpower managers and the manpower researchers about potentially profitable studies.

First is the matter of how to make the personnel dollar go as far as possible when the draft is suspended. The manpower researchers must seek to assess a host of complex alternatives that range from a substantial increase in the pay levels of first term enlistees to larger bonuses for reenlistments or relatively more pay for certain scarce specialists who are in short supply in the civilian labor force.

A related set of calculations must be made frequently to take account of the changing preferences of both those on active duty and those whom the Services are seeking to recruit. The preferences of both groups are likely to change as their underlying attitudes and behavior toward work and careers change and, equally important, as the civilian economy loosens or tightens its requirements for labor. Clearly, manpower analyses such as those described above require more than a powerful model which permits the rapid calculation of different outcomes as critical determinants in the equations are changed. To have validity, such studies must be linked to survey research techniques which, at least on a sampling basis, provide new information about the stability or change of critically important values and preferences. Clearly, the assessment of the ways in which the personnel budget can be expended within the rigidities of Congressional legislation and administrative regulations, and taking account of prior commitments to the personnel already on active duty, is a task that can be carried out only with the help of sophisticated staff making use of sophisticated models and techniques. It represents a major challenge to the Services in the years ahead but they must meet it if they do not wish to jeopardize their capacity to meet their manpower requirements within their appropriations.

A related set of considerations which the manpower managers will need to keep under continuing review are the relative gains in costs and efficiency that might accrue from a shift in the composition of the types of personnel used by the Services, including military, civilian, contract, and indigenous. Here, too, because of legislative and administrative constraints, the Services' manpower managers may have only limited degrees of freedom, particularly in the short run, but even within these limits they must pay close attention to potential gains from altering the composition of their force.

A related dimension of these issues would be an analysis in depth of whether the Services stand to gain from introducing changes in

one of the most traditional personnel arenas, namely, the proportion of officers to enlisted men and the associated question of changes in the distribution of ranks and grades within each. Admittedly, many difficulties would be encountered by the senior staff and their personnel specialists if they sought to alter radically the long established relationships. But the Services are entering a new era and it behooves them to study all the major alternatives to determine whether they can, through altering their personnel structure, stretch their dollars, and at the same time maintain attractive career options and force effectiveness.

Since the Services will depend increasingly for their manpower on career personnel, they would be well advised to study at least two important dimensions of career service. The first is whether they can introduce a considerable degree of "freedom of choice" in current benefits and particularly in retirement benefits available to men after they complete their period of service. Such efforts are now engaging large civilian organizations and the Services might well pay attention to the potentialities in a system whereby prospective retirees have options about their benefits. This freedom of choice might make the existing benefits more potent as a recruitment and retention device.

A related matter is the operational difficulties that the Services are likely to face as a consequence of the aging of their forces which in turn will be a consequence of their relying increasingly on career personnel. In this event, the Services would be well advised to undertake a series of studies of how they might convert some of their retirement benefits into other benefits--i. e., early separation allowances--and tie them to shorter tours of completed duty. For instance, it might be wise to limit the term of service for most combat pilots to ten or twelve years rather than to attempt to retain them for twenty or more years.

Without the draft, the Services may find that they are unable to meet their minimum requirements for certain specialists, such as medical specialists. Since this is likely to be the situation, the Services would be well advised to explore as early as possible alternative methods whereby they might be able to meet their operational needs. For instance, they should explore the potentialities of contracting out most hospital care in the Zone of the Interior. Admittedly, such an alternative may have serious drawbacks both in terms of quality of care and the elimination of rotational assignments, but once they lose the power to compel people to serve in uniform the Services may find that their only options are less or more undesirable alternatives.

However, the manpower managers, working with other sections of their general staffs, should explore the potentialities of contracting

out, not only as a possible response to overwhelming limitations of manpower supply but also as a more economic and efficient way of obtaining essential services under conditions of a zero draft. Among the areas where selective contracting should be studied to explore its feasibility and desirability are pre-service technical training, food service, transportation, warehousing, supplies and other support activities.

The bias of the senior staff is against most of the foregoing explorations on the ground that the Services will inevitably be weakened if they lose control over the personnel and functions on which their efficiency depends. In their view, a military force needs its own medical and other logistical support; it must train and control its own men if they are to be available and perform effectively in combat. Nevertheless, circumstances are changing and new patterns of staffing may prove feasible even if they are not always preferred solutions. Moreover, since money is one constraint and the abolition of the draft a second, the senior staff has no option but to explore many alternatives which they might prefer to ignore. The argument embodied in this chapter, in fact in the entire report, is that the senior staff will be better able to manage their manpower and perform their missions if they make optimum use of the new knowledge and insight that they can garner from manpower research.

To this end, OSD and the Services should aim to broaden and deepen their manpower research effort, insure that it remains well nourished by funds and personnel, that it is closely linked to priority command concerns, that its effectiveness is kept under continuing evaluation with the help of civilian consultants, and that above all the results are fed into policy and programming so that the manpower management of the Department of Defense can be improved.

In large organizations manpower research is the key to improved manpower management. OSD and the Services should make full use of it.

8. Challenges to Large Organizations

There is considerable support in this report for preconceived ideas about excessive bureaucracy and malutilization of manpower as characteristic of military organizations. But the thrust of our findings and recommendations suggests many similarities in the way in which large organizations, be they military or civilian, utilize manpower research as a tool for more effective manpower management. In this concluding chapter we will call attention briefly to many lessons derived from our study of the Defense Department which have applicability for large civilian organizations. We will deal sequentially with problems of research organization, research methods, research agenda, and the implementation of research findings.

With respect to the organization of research, many difficulties that we identified within the Department of Defense have their counterparts in large civilian organizations. Specifically, top corporate executives frequently have even less interest than senior military managers in the potential contribution of manpower research. It is only within the last decade that the largest among our corporate enterprises have established manpower planning elements. A sampling of a cross-section of large civilian organizations revealed that even as late as 1971 about half had not yet established a manpower planning unit. On this front, the Defense Department is several steps ahead of the typical large civilian organization.

We found that one deterrent to the productivity of the Defense manpower research effort is the failure of top commanders to devote the time and effort to identify the major policy areas which require new answers. A similar neglect characterizes top management in the civilian sector. By failing to consider where the organization is and where it is likely to go, they leave their manpower researchers with inadequate guidance.

We called attention to the tendency in the Services for research proposals to float up from the bottom in the absence of policy guidance from the top. We noted also that researchers who are left to work largely on their own are likely to continue doing tomorrow what they successfully did yesterday. In large civilian organizations, the same lack of leadership leads to the same results. In the absence of strong top management involvement, when the research staff has found areas in which it can work comfortably, it continues to work on the same projects long past the point of effective return.

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Thus, many weaknesses that we uncovered in the organization and management of manpower research within the Department of Defense are not specifically military. Most of these problems are reflected in large civilian organizations. They are generic to large organizations.

In the arena of research methodology we called attention to the Services' failure to devote sufficient resources to developing computer models for manpower planning; to their neglect in exploiting their rich personnel records; to their ignoring breakthroughs in evaluation approaches; to their slowness in deciding to use computerized instruction in their far-flung training programs; in experimenting with other modifications and adaptations in training and in undertaking large-scale efforts to simplify their occupational structures in order to improve their assignment procedures. In these, and other regards, we found that the Services have not moved as far or as fast as we would consider desirable in deepening their research methodologies which provide, of course, the basis for increasing their research productivity.

A casual look at the civilian scene indicates the same shortcomings. There is almost no corporate research devoted to simplifying occupational structures and the civilian governmental agencies are moving at a snail's pace.

On the training front the civilian picture is mixed. As we noted earlier, the airlines moved aggressively to use simulators and many companies have experimented with computer-assisted instruction. But no industry is ahead of the Services although an occasional company may be.

Much the same is true of personnel evaluation. A few companies have experimented with new approaches, such as assessment centers. But it would be difficult to point to an industry that is far ahead of the military.

With regard to research based on their own personnel records, few companies in the civilian sector have made much progress. In his recent book, Education and Jobs: The Great Training Robbery (1970), Professor Ivar Berg reported that several large companies which he studied had never analyzed their own records to test the validity of their personnel policies. He found not one but many companies which were pursuing policies clearly counterindicated by their own experience.

Even large companies with high labor costs have moved slowly to use the computer for manpower planning. Our recommendation to

the military to increase its effort in this arena is equally pertinent for the civilian sector.

We come now to the heart of the matter--the problems that do land on the research agenda. Among the weaknesses in the Defense Department we identified that the Services still do not know how to assess reliably the potential for effective performance of men from disadvantaged groups or who have certain stigmata, such as criminal records. In addition, the Services have not found low cost methods of introducing recruits into the military environment. The Services are also encountering difficulties in adjusting their personnel policies and procedures to take account of the new values and attitudes characteristic of the new recruits. Moreover, the Services have not introduced much freedom of choice into the assignment and reward system.

All of these issues, some more than others, are also characteristic of large civilian employers. The civilian sector has not moved farther than the Defense Department in exploring these complexities and in resolving them. And with respect to many of these issues it has done less research and is even farther away from sound answers.

This brings us to the last arena: the interface between manpower research and manpower management. Here we noted in our review of the Department of Defense the following important dimensions: the avoidance of researching conflict-laden areas such as racial tensions and drug addiction; the imbalance between the expressed concern of the military with questions of leadership and its investment in researching the problem; the avoidance of considering how changes in the organization's structure or operations might lead to manpower economies and efficiencies.

Once again, we stress that the hesitancies, shortcomings, and errors uncovered as part of our review of the Department of Defense are not inherently military, but reflect generic characteristics of large organizations. For example, even a casual knowledge of corporate life indicates that top civilian management also shies away from explosive issues--that is, until they explode, as in the urban race riots of the 1960's. In addition, top executives, although they talk about the importance of leadership for continuing profitability do little to support objective inquiry into how the processes of managerial selection can be strengthened. Moreover, it would not have required legislative and administrative efforts to break down the pervasive prejudice that exists in the hiring and promotion policies of large organizations if top management had been in the practice of looking at its manpower objectively and seeking ways to assure its optimal use.

Most large corporations are not undertaking penetrating analyses of their organizational structures and methods of operation and they certainly are not inviting outsiders to do so. They prefer to live with the inefficiencies they know than to risk the disturbance that often follows such inquiries.

There is no need to prolong this exercise in counterpoint. The unequivocal conclusion is that the many strengths and weaknesses we pointed up in our appraisal of manpower research and manpower management in the Department of Defense are paralleled in large civilian organizations. The problems with which this report has been concerned are problems inherent in large organizations and are only secondarily affected by the specific environment, military or civilian, in which these organizations operate.

The nation would learn a great deal if the Department of Defense and large civilian organizations could work cooperatively in the design and carrying out of manpower research and in exploring how research findings can be used to improve management.

Our national tradition separates the military from the civilian sector and commands each to go its own way, performing its mission as effectively as possible without presuming on the other's territory. But this principle of separation must be voided in the pursuit of new knowledge and in seeking the more effective use of the nation's human resources.

APPENDICES



Appendix I

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING
WASHINGTON, D C 20301

10 February 1970

MEMORANDUM FOR THE CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Manpower Research Task Force

Will you please convene a Manpower Research Task Force in the near future. I would like the Task Force to:

- 1) determine high priority problems in the fields of manpower and personnel planning that the armed forces are likely to encounter as they
 - a) meet Presidential goals for voluntary service;
 - b) implement reduced personnel ceilings; and
 - c) adjust their manpower pool to new strategic guidance.
- 2) assess DoD research capabilities and policies with regard to
 - a) capacity to contribute needed knowledge to manpower planning and operations;
 - b) required scale of funding and personnel; and
 - c) appropriate roles for OSD, the individual Military Departments, in-house laboratories and external research performers.

A statement elaborating on the nature of the requirement for this Task Force is attached.

The cognizant officials for this Task Force will be Dr. Donald M. MacArthur, Deputy Director (Research and Technology), and Mr. Paul Wollstadt, Deputy Assistant Secretary of Defense for Manpower Research and Utilization. I would like the Task Force to complete its work not later than May 15, 1970.

/s/

John S. Foster, Jr.

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Requirement for DoD Manpower Research Task Force

1. The Department of Defense is faced with a number of contingencies which may have critical impact on the military personnel management system. Prior planning and research involving major re-examination of manpower and personnel policies is required to insure adequate and appropriate response. The proposed DoD Manpower Research Task Force will identify the issues involved and provide guidelines for DoD manpower planning and research efforts.

a. Volunteer force: The President has directed the Military Services to develop and implement plans for an all volunteer military force. This may result in significant shifts in the skill composition, racial mix and educational level of the force. New non-economic incentives and efforts to create a working climate more in line with that of civilian institutions may be required in order to attract top talent. Major changes in personnel policies including provision for lateral entry may be necessary. Such implications of the volunteer force must be clearly identified so that appropriate action may be taken.

b. Manpower ceiling reduction: Drastic reduction in manpower ceilings which are presently pending require comprehensive examination of means for increasing the productivity of individuals in the force. This involves questions such as: How can implementation of less labor intensive technologies be encouraged? What additional man-machine trade-offs can be achieved? How can individual motivation be increased? How can teamwork be improved? Is there some rational basis for implementing manpower cut backs to minimize impact on needed operational capabilities? How can less productive individuals be identified and trimmed from the force? How can changes in organizational design be planned and implemented to reduce redundancy and "Organizational overhead?" What will be the impact of military manpower cutbacks on the broader society with regard to unemployment?

c. Changes in strategic guidance: Continued updating of strategic guidance requires planned changes in the size and composition of the manpower force in terms of the nature and levels of skills required, appropriate grade structures, and the degree of flexibility required in cross utilization of manpower between mission areas. Possible changes in recruitment, retention, training, education and rotation policies must be evaluated.

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2. The DoD manpower research effort is the only significant source of new technologies available to DoD for improved utilization of the approximately \$40 billion per year expended to maintain the manpower force. Questions such as the following need attention:

a. Capability: Is the present research program of the required high quality? Are the research problems with the greatest potential payoff getting adequate attention? Are the outputs of the program being fully and effectively utilized within the operating systems? What improvements are needed in the research management system to significantly improve the operational payoff from the research effort?

b. Scale: R&D support for the military and civilian personnel management function has been minimal. What scale of funding is required for an effective DoD manpower research program? What is the appropriate level of staffing for such a program? Are present programs able to attract research professionals of the required level of competence? If not, what corrective actions are required?

c. Organization: Manpower research has often been subordinated to hardware research and has suffered from difficulties in developing adequate coordination between the Services. Should "personnel management and training" be designated as a system for R&D systems management approach? Should whatever R&D resources that exist be restructured into a central personnel management systems research agency and deployed along RDT&E lines? Should "lead laboratories" or "lead Services," be designated to reduce possible redundancies and increase attention to key functional areas? Should R&D be centralized in DoD? If decentralized under the Military Departments should it be managed through normal research channels or placed under the Deputy Chiefs of Staff for Personnel?

Appendix II

Individuals Who Appeared Before the Task Force

Brigadier General James B. Adamson, Director of Plans, Studies and Budget, Office of the Deputy Chief of Staff for Personnel, Department of the Army

Brigadier General Carroll H. Bolender, Deputy Director of Development and Acquisition (Research and Development), Department of the Air Force

Honorable Richard J. Borda, Assistant Secretary of the Air Force for Manpower and Reserve Affairs

Captain George F. Britner, Chief, Personnel Research Division, Bureau of Naval Personnel

Lt. Colonel Ogden Brown, Assistant to the Deputy for Reserve Affairs and Education, Office of the Assistant Secretary of the Air Force (Manpower and Reserve Affairs)

Dr. Ralph R. Canter, Director of Manpower Research, Office of the Deputy Assistant Secretary (Manpower Research and Utilization), Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs)

Brigadier General Robert B. Carney, Deputy Assistant Chief of Staff, G-1, Headquarters, U.S. Marine Corps

Rear Admiral Ernest E. Christensen, Assistant Deputy Chief, Naval Operations (Development)

Dr. John Collins, Assistant Director for Personnel Logistics, Office of the Chief of Naval Operations

Commander H. J. Connery, Assistant for Human Factors Analysis, Office of Director, Research, Development, Training and Engineering, Department of the Navy

Dr. Meredith Crawford, President, Human Resources Research Organization (HumRRO)

Major General Franklin M. Davis, Jr., Director of Military Personnel Policies, Office of the Deputy Chief of Staff for Personnel, Department of the Army

Dr. K. C. Emerson, Assistant for Research, Office of the Assistant Secretary of the Army (Research and Development)

Rear Admiral John G. Finneran, Assistant Chief for Plans and Programs, Bureau of Naval Personnel

Mr. Sidney Friedman, Special Assistant (Research) to the Assistant Secretary of the Navy (Manpower and Reserve Affairs)

Honorable Robert A. Frosch, Assistant Secretary of the Navy (Research and Development)

Mr. Edward M. Glass, Assistant Director, Laboratory Management, Office of Deputy Director (Research and Technology), ODDR&E

Mr. James P. Goode, Acting Assistant Secretary of the Air Force (Manpower and Reserve Affairs)

Colonel Marvin Grunzke, Office of Personnel Planning, Office of Deputy Chief of Staff for Personnel, Department of the Air Force

Honorable Grant L. Hansen, Assistant Secretary of the Air Force (Research and Development)

Dr. Charles M. Hersh, Special Assistant to the Director of Plans, Studies and Budget, Office of Deputy Chief of Staff for Personnel, Department of the Army

Honorable Roger T. Kelley, Assistant Secretary of Defense (Manpower and Reserve Affairs)

Major General John B. Kidd, Director of Personnel Planning, Office of Deputy Chief of Staff for Personnel, Department of the Air Force

Major General Henry B. Kucheman, Assistant Deputy Chief of Staff, Research and Development, Department of the Air Force

Dr. William L. Lehmann, Deputy for Laboratories, Office of the Assistant Secretary of the Air Force (Research and Development)

**Major General John L. Locke, Assistant Deputy Chief of Staff for
Personnel, Department of the Air Force**

**Dr. Donald M. MacArthur, Deputy Director (Research and Technology),
Office of the Director of Defense Research and Engineering**

**Lt. Colonel Alvin L. Meredith, Staff Officer, Human Factors Branch,
Behavioral Sciences Division, Army Research Office**

**Colonel Joseph T. Odenthal, Chief, Personnel Research Branch, G-1,
Headquarters, U.S. Marine Corps**

**Lt. Colonel John Pappageorge, Acting Chief of Recruiting and Training,
Office of Assistant Secretary of the Army (Manpower and
Reserve Affairs)**

**Mr. Eugene M. Ramras, Technical Director, Naval Personnel Research
and Development Laboratory**

**Dr. William P. Raney, Special Assistant (Research) to the Assistant
Secretary of the Navy (Research and Development)**

**Colonel James Shepard, Director, Personnel Research Division, Air
Force Human Resources Laboratory**

**Rear Admiral Burton H. Shupper, Assistant Deputy Chief of Naval
Operations (Manpower)**

**Mr. Allan A. Sjolholm, Technical Director, Personnel Research Divi-
sion, Bureau of Naval Personnel**

**Brigadier General George M. Snead, Director of Army Research,
Office of the Chief of Research and Development**

**Mr. Francis V. Sullivan, Office of Deputy Assistant Secretary
(Resources Analysis), Office of Assistant Secretary of Defense
(Systems Analysis)**

**Dr. Julius E. Uhlaner, Chief, Behavioral and Systems Research
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